REMEDIAL SITE ASSESSMENT DECISION - EPA REGION IV

EPA ID: KYD098950306 **Site Name:** EATON CORP BOWLING GREEN PLT **State ID:**

Alias Site Names: EATON CORP BOWLING GREEN PLT
EATON CORP/STD POWER CONTROL DIV

City: BOWLING GREEN **County or Parish:** WARREN **State:** KY

Refer to Report Dated: **Report Type:** SITE INSPECTION 002

Report Developed by:

DECISION:

- [X] **1. Further Remedial Site Assessment under CERCLA (Superfund) is not required because:**
  - [ ] **1a. Site does not qualify for further remedial site assessment under CERCLA (No Further Remedial Action Planned - NFRAP)**
  - [X] **1b. Site may qualify for action, but is deferred to:**
- [ ] **2. Further Assessment Needed Under CERCLA:**
  - **2a. Priority:** [ ] **Higher** [ ] **Lower**
  - **2b. Other: (recommended action)** Deferred to RCRA (Subtitle C) or NRC

DISCUSSION/RATIONALE:

This site file was reviewed for final disposition as part of an audit of Kentucky CERCLIS sites.

An EPA contractor inspected the facility the week of December 11, 1990. Their inspection identified 15 solid waste management units(SWMUs) and 2 areas of concern. All but three were either inactive or well managed. Three SWMUs were recomended for further low priority assessment.

As part of this file review, EPA contacted the Kentucky Division of Waste Management hazardous Waste Inspector for this facility. The inspector mentioned that the facility does not have a TSD permit, but it is a small quantity generator. Additionally, the facitlity is in the process of shutting down operations by August 1997. The company plans to conduct a cleanup of the site in 1998. There are no specifics provided of the nature and extent of the planned cleanup.

The information gathered during this file review suggests that a follow-up inquiry of the status of the site be conducted. No further action is necessarily recommneded.

Reviewer: Nestor Young
May 21, 1997

Site Decision Made by:

Signature: _____ **Date:** 02/28/1990

EPA Form # 9100-3

34534

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 4
ATLANTA FEDERAL CENTER
61 FORSYTH STREET
ATLANTA, GEORGIA 30303-8960

JUL 29 1999

Mr. Herb Petitjean, Superfund Branch
KY Department for Environmental Protection
Natural Resources and Environmental Protection Cabinet
14 Reilly Road
Frankfort, KY 40601-1190

SUBJ: Eaton Corporation Site
EPA ID Number KYD 098 950 306

Dear Mr. Petitjean:

Enclosed you will find EPA's comments regarding the SI Report developed by your office for the above referenced site. The report, due to the lack of field work conducted at the site, and the lack of HRS scoring, does not provide sufficient documentation to support the no further remedial action planned (NFRAP) recommendation for this site.

Contamination at Eaton could be evaluated/addressed through the RCRA program, in which case the CERCLIS status will remain "deferred to RCRA". RCRA corrective action authorities and/or the requirement to submit a RCRA "clean closure equivalency demonstration" could be applied here. If the owner/operator is unwilling or unable (financially) to comply with these RCRA requirements, KY DEP or EPA should continue pursuing the site through CERCLA. Completion of this SI will require a sampling visit to fill the data gaps identified in these comments. The SI Report should then be revised, including a scoring of the site, and resubmitted to EPA.

Please call me at (404)562-8825 if you have any questions about these comments. I would be happy to assist you in developing a sampling plan if you decide to pursue completion of the SI.

Sincerely,

Richard R. Campbell, P.E., KY/TN Section
North Site Management Branch

cc. Harold Taylor, NSMB
Mohammad Alauddin, KYDEP
Caron Falconer, RCRA Programs Branch
Eaton File
enclosure

CADOCS\990714Ea.wpd

CONFIDENTIAL
FOIA EXEMPTION 5 - PREDECISIONAL INFORMATION

Eaton Corporation, EPA ID #KYD098950306
Comments on July 27, 1998, Site Inspection Report

1) According to CERCLIS, Eaton has now received three SIs, though the second one was actually a RCRA/CERCLA "Environmental Priorities Initiative" report. The site was assigned a "deferred to RCRA" status following this second (1990) SI. This third SI may actually be unnecessary, due to the RCRA deferral, but the reason for doing it was because the plant closed down and there was reportedly some sort of final site cleanup planned to be conducted by Eaton in 1998. Reference the attached decision form. There was a perceived need to look at possible sources of contamination that had not been previously evaluated during active operations. No sampling, (or even a site visit?) was conducted for this most recent SI, however, so it does not appear possible that this new objective was accomplished. Also, the site has not been actively pursued under the RCRA program.

2) The site was not scored.

There is documented evidence presented in this SI report of observed releases at the site. Samples taken during the RCRA closure demonstrate that the impoundments released hazardous substances to the subsurface, and that these releases were not completely cleaned up during the RCRA closure, despite the fact that these samples were analyzed for EP toxicity and cyanides only. The KY Division of Water also investigated a complaint of chemical seepage to the "Lost River". A Division of Water memo in Appendix B states that samples collected in the Lost River show contamination consistent with the contents of the Cutler Hammer (Eaton) impoundments. The data is not included, however. This data and target information for the Lost River should be included in the SI Report and used to score the site.

Three times background, particularly when samples are analyzed for EP toxicity and cyanides only, is not the appropriate criteria for determining that all waste is removed from the site. In other words, it is not a cleanup level. Three times background is the criteria to be used, in lieu of direct observation (i.e. witnessing) a release, for making a determination, based on chemical analysis, of an observed release to the environment *prior to conducting cleanup activities*. See 40 CFR §300 Appendix A, Section 2.3. Also attached is some more recent guidance on qualified removals. Once it is established that a release has occurred, the waste quantity can only be reduced to zero if impacted soils and groundwater are completely removed. This should be determined by comparison to background or appropriate health based screening levels for all constituents of concern and all media.

Because there is an observed release at this site, the waste quantity should not be zero, and other HRS factors should not be affected by the qualified removal. Hence the site score should not be zero.

REMEDIAL SITE ASSESSMENT DECISION - EPA REGION IV

EPA ID: KYD098950306 **Site Name:** EATON CORP BOWLING GREEN PLT **State ID:**

Alias Site Names: EATON CORP BOWLING GREEN PLT
EATON CORP/STD POWER CONTROL DIV

City: BOWLING GREEN **County or Parish:** WARREN **State:** KY

Refer to Report Dated: **Report Type:** SITE INSPECTION 002

Report Developed by:

DECISION:

- [X] 1. Further Remedial Site Assessment under CERCLA (Superfund) is not required because:
  - [ ] 1a. Site does not qualify for further remedial site assessment under CERCLA (No Further Remedial Action Planned - NFRAP)
  - [X] 1b. Site may qualify for action, but is deferred to:
- [ ] 2. Further Assessment Needed Under CERCLA:
  - 2a. Priority: [ ] Higher [ ] Lower
  - 2b. Other: (recommended action) Deferred to RCRA (Subtitle C) or NRC

DISCUSSION/RATIONALE:

This site file was reviewed for final disposition as part of an audit of Kentucky CERCLIS sites.

An EPA contractor inspected the facility the week of December 11, 1990. Their inspection identified 15 solid waste management units(SWMUs) and 2 areas of concern. All but three were either inactive or well managed. Three SWMUs were recomended for further low priority assessment.

As part of this file review, EPA contacted the Kentucky Division of Waste Management hazardous Waste Inspector for this facility. The inspector mentioned that the facility does not have a TSD permit, but it is a small quantity generator. Additionally, the facitlity is in the process of shutting down operations by August 1997. The company plans to conduct a cleanup of the site in 1998. There are no specifics provided of the nature and extent of the planned cleanup.

The information gathered during this file review suggests that a follow-up inquiry of the status of the site be conducted. No further action is necessarily recommneded.

Reviewer: Nestor Young
May 21 '997

Site Decision Made by:

Signature: _____ Date: 02/28/1990

Recd 8/3/98 CA
CA

JAMES E. BICKFORD
Secretary

PAUL E. PATTON
Governor

COMMONWEALTH OF KENTUCKY
NATURAL RESOURCES AND ENVIRONMENTAL PROTECTION CABINET
DEPARTMENT FOR ENVIRONMENTAL PROTECTION
FRANKFORT OFFICE PARK
14 REILLY RD
FRANKFORT KY 40601

July 27, 1998

Mr. Harold Taylor
U.S. Environmental Protection Agency, Region 4
The Atlanta Federal Center
100 Alabama Street, SW
Atlanta, GA 30303

Re: Site Investigation (SI)
Eaton Corporation Site
Bowling Green, Warren County, KY
EPA ID# KYD098950306

Dear Mr. Taylor:

The Kentucky Division of Waste Management (KYDWM) has completed a Site Investigation (SI) of the Eaton Corporation Site (EPA ID# KYD098950306) in Bowling Green, KY. The report and associated documentation are enclosed. No PreScore hazard ranking package has been prepared since the hazardous waste in question has been eliminated through a qualified removal.

Eaton Corporation is located approximately 2.5 miles southwest of downtown Bowling Green, Warren County, Kentucky. The facility is located on approximately 17 acres of flat land in an industrial portion of Bowling Green. The facility is not currently in operation The major feature of the facility property is a plant building, which comprises about 470,000 square feet. Just to the north of the plant building are four closed impoundments (two settlement and two sludge-drying) and a sinkhole which was used to discharge clarified wastewater from the settlement ponds.

Prior to installation of a two-phase wastewater treatment system in 1981, the facility operated four surface impoundments for settlement and sludge drying. Effluent from the settling ponds was discharged into a sinkhole under an NPDES permit. During closure, 100,000 gallons of standing water were pumped from the impoundments and treated. The sludge was stabilized with lime kiln flue dust and a total of 7,200 tons of sludge, liner, and contaminated soil were excavated and shipped to CECOS Environmental, located in Williamsburg, Ohio. Final closure was approved by the state on December 11, 1984. The impoundments are currently covered by well-maintained grass.

Due to the lack of hazardous materials at the site, the site is recommended for No Further Action under Superfund. It is further recommended that this site be archived from CERCLIS.

If you have further questions, please contact Herb Petitjean at (502) 564-6716 Ext 268 or Petitjean@NRDEP.nr.state.ky.us.

Sincerely,

Fazi Sherkat
Manager
Superfund Branch

FS:hcp:hcp

enc.: report

cc: Herbert Petitjean
file room
field office (w/o appendices)
Ernie Kulik (Eaton) (w/o appendices)

Site Investigation

of

Eaton Corporation Site
Fizgerald Industrial Drive
Bowling Green, KY 42101
EPA ID# KYD098950306

Prepared by
Herbert Petitjean
Env. Tech. Chief
KY Department for Environmental Protection
Division of Waste Management
Superfund Branch

July 23, 1998

Table of Contents

Introduction

A Site Investigation was conducted of the Eaton Corporation Site by the Kentucky Department for Environmental Protection, Division of Waste Management (KyDWM), Superfund Branch, under the authority of CERCLA of 1980 as amended by SARA of 1986. The Superfund Branch, KyDWM, is tasked with implementing the PA/SI program in Kentucky through a grant from USEPA.

A Site Investigation tests Preliminary Assessment hypotheses requiring further investigation and may be used to screen sites to determine the need for further Federal Superfund action. This report assesses the Eaton Corporation Site on Fitzgerald Drive in Bowling Green, Warren County, KY. The coordinates of the facility are 36° 57' 30" N and 86° 28' 47" W. (Appendix A)

Site Description

Eaton Corporation is located approximately 2.5 miles southwest of downtown Bowling Green, Warren County, Kentucky. The facility is located on approximately 17 acres of flat land in an industrial portion of Bowling Green. The facility is not currently in operation The major feature of the facility property is a plant building, which comprises about 470,000 square feet. Just to the north of the plant building are four closed impoundments (two settlement and two sludge-drying) and a sinkhole which was used to discharge clarified wastewater from the settlement ponds. The sinkhole is located just beyond the fence which runs along the northern border of the facility property.

Site History

The facility was in operation from 1965 until late 1997. The property is owned by the city of Bowling Green and is leased to Eaton Corporation. Eaton Corporation maintains headquarters in Cleveland, Ohio.

Operations at the facility included the fabricating, thermomolding, electroplating, assembly, and painting of devices for the control of electric motors. Some of these devices included switch boxes, contactors, timer relays, and motor starters. These products ultimately were the connection between electrical power and a running motor. Parts were either fabricated from metals such as sheet steel, copper, alloys, and small amounts of aluminum or molded from thermoplastic. The metals were then electroplated with either zinc, tin, nickel, or silver. Some of the assembled units were pretreated and then painted as part of the finishing process. The completed devices were commonly used on industrial and commercial machinery where the mechanical machine function needed to be controlled. In addition, some of these devices were used to protect the motor from heat damage caused by overcurrents. Typical customer base consisted of original equipment manufacturers, industrial users, and the resale market through authorized distributor wholesalers.

Prior to installation of a two-phase wastewater treatment system in 1981, the facility operated four surface impoundments for settlement and sludge drying. Effluent from the settling

ponds was discharged into a sinkhole under an NPDES permit. During closure, 100,000 gallons of standing water were pumped from the impoundments and treated. The sludge was stabilized with lime kiln flue dust and a total of 7,200 tons of sludge, liner, and contaminated soil were excavated and shipped to CECOS Environmental, located in Williamsburg, Ohio. Final closure was approved by the state on December 11, 1984. Past evaluations have raised questions about the adequacy of the closure.

Previous Site Evaluations

Discovery (Aug. 1, 1980) The Discovery Date of the site is listed as August 1, 1980 on CERCLIS. The author has been unable to identify an environmental incident to trigger the listing. Perhaps the site was initially listed through some screening mechanism based on industrial classification or permit status.

Various documents (Kentucky Division of Waste Management, Fall 1982) (Appendix B) Evidence was found that impoundments were leaking. Evidence included loss of liquid from the impoundments and chemical seepage observed in a cave beneath the site.

Preliminary Assessment (Kentucky Division of Waste Management, March 23, 1984) (Appendix C) The report noted that the impoundments were scheduled to be closed and concluded that "the site requires no further action and should be removed from the uncontrolled site list."

Closure (Appendix D and E) The impoundments were deactivated in 1981. Eaton and the State of Kentucky discussed action to be taken on the closed impoundments from 1981 to 1983. A plan was agreed upon in March 1983. The closure activities were completed and an application for closure was submitted on October 18, 1984. The closure certification was approved by the State on December 11, 1984. Groundwater monitoring between 1981 and 1984 found no contamination. Eaton was relieved of its groundwater monitoring requirement in 1985.

Inspection to Assess Compliance with Closure / Post Closure Requirement Report (Alliance Technologies Corporation, April 23, 1987) (Appendix E) This evaluation of the closure noted that in some cases the final analytical results exceeded the two-times-background remediation goal which was agreed upon with the state. None the less, the closure was approved by the state. Because of the state approval, and because no contamination was detected during groundwater monitoring, it was determined that the closure did not violate 40 CFR 265.

Preliminary Reassessment (FIT 4, September 2, 1988) (Appendix F) The report concluded "Based on the above referenced material, the site's location in a karst area, and the enclosures, a site screening investigation of medium priority is recommended." (In the scoring package which accompanied the report, the investigator used 5000 cubic yards as the waste quantity. The source of this value is unknown. Under current guidance, the closure would be a qualified removal and the waste removed would not be included in the waste quantity used to score the site. Appendix G)

Inspection to Assess Compliance with Closure / Post Closure Requirements Report (EPA Region IV, December 2, 1988) (Appendix H) This report notes deficiencies in the groundwater monitoring. However, it also notes the difficulties of collecting representative ground and surface water samples at the site.

Environmental Priorities Initiative Preliminary Assessment (NUS Corporation, March 13, 1990) (Appendix I) This evaluation included a Visual Site Inspection which identified 15 Solid Waste Management Units (SWMUs) and 2 Areas of Concern (AOCs). Three of the SWMUs were recommended for further assessment

- SWMU 5 (Drum Storage Area) There was no containment in this area. It was recommended that full drums should be transferred to the storage area, and partial/used drums should be transferred to the hazardous waste drum storage area.
- SWMU 1 (Former location of settling and sludge drying ponds) and SWMU 2 (Discharge sinkhole) These two SWMUs were suggested for sampling on a low-priority basis.
- All other SWMUs and AOCs were recommended for no further action.

(In the scoring package which accompanied the report, the investigator used 7200 cubic yards as the waste quantity. This is the amount of stabilized sludge, liner and contaminated soil which were removed and shipped to CECOS Environmental in Williamsburg, Ohio Under current guidance, the closure would be a qualified removal and the waste removed would not be included in the waste quantity used to score the site.)

Impoundment Closure and CERCLA

As noted earlier, the closure is a qualified removal and the material removed would not be included in the evaluation of the site under CERCLA.

Questions have been raised concerning the apparent failure of the cleanup to achieve the remediation goal of two-times-background. George Gilbert, of the Kentucky Department of Environmental Protection, indicated that some of the samples did not extend to clean soil because the soil in those areas was removed to bedrock and the final samples were taken from pockets in the bedrock.. Even in these cases, the **contamination was still less than the three-times-background level** which would constitute a release under CERCLA. (Appendix E)

The closed impoundments have been backfilled and currently have a well maintained cover of grass.

Surface and Groundwater Pathways

Surface runoff from the site discharges to the sinkhole at the corner of the northwest property. Dye test at a facility 0.25 miles north of Eaton Corporation found that groundwater at that facility entered into Lost River, a subterranean river which flows into Jenkins Creek. (Appendix J) It is highly likely that water from the sinkhole also finds its way to Lost River. After entering Lost River, the water would flow about 4.5 miles before coming to the surface at Lost River Rise. It would then would then travel about 6.0 stream miles to the Barren River. The point of confluence is downstream from the Bowling Green Municipal Utilities intake (mile

marker 37.82) and the Warren County Water District intake (mile marker 34.35). Barren River is used for fishing, swimming and recreational boating. Jenkins Creek may have limited recreational and fishing usage.

The Preliminary Assessment (Appendix I) used topographic maps to estimate that 247 households within a four-mile radius were not on municipal water. Using their value of 3.8 persons per household, this translates to 939 people. Using 1990 Census data (Appendix K) produces an estimate of 106 people not on municipal water. The nearest identified well user is 5,700 feet from the site (Appendix L).

Soil and Air Pathways

The closed impoundments have been backfilled and have a well-maintained cover of grass. This would effectively eliminating the soil and air pathways, if there were any remaining hazardous materials.

Critical Habitats and Endangered Species

There are no critical habitats in Warren County, Kentucky, however, Mammoth Cave National Park is located about 25 miles northeast of the facility. Barren River contains a federally endangered species of mussel. Several federally endangered or threatened species have been identified for general distribution in the study area. These species include the gray bat, the Indian bat, the eastern cougar, the bald eagle, and the Arctic peregrine falcon. (Appendices F & I)

Conclusion

The surface impoundments have been closed in accordance with RCRA. The closure was approved by the state of Kentucky. Allied Technologies Corporation, under contract to the EPA, raised questions about the closure but did not find any violations of 40 CFR 265. The closure was a qualified removal under CERCLA, eliminating any waste source to evaluate. Samples which exceeded the remediation goal of two-times-background are explained by the cleanup reaching bedrock. Otherwise, these excesses were under the three-times-background quantity which constitutes a release under CERCLA. Groundwater sampling found no contamination. The cover continues to be maintained.

The site is recommended for No Further Remediation. It is further recommended that this site be archived from CERCLIS.

Not a cleanup level!

References

USGS 1973: Topographic Map of Hadley, KY.

USGS 1968: Topographic Map of Bowling Green North, KY.

USGS 1968 (PR 1982): Topographic Map of Bowling Green South, KY.

USGS 1973 (PI 1979): Topographic Map of Rockfield, KY.

KYDWM 11/24/1982: Letter of Warning, Curry.

KYDWM 12/1/1982: Memorandum to Schroeder, Curry.

KYDWM 3/9/1983: Letter to Smith, Haight.

Dames & Moore 6/11/1984: Closure Plan.

Dames & Moore 6/14/1984: Closure Plan Revision.

Dames & Moore 10/15/1984: Final Closure Certification

Eaton 10/18/1984: Application for Closure, Kitscha.

KYDWM 12/11/1984: Closure Approval.

Alliance Technologies Corporation, April 23, 1987: Inspection to Assess Compliance with Closure / Post Closure Requirement Report

FIT 4, 9/2/1988: Preliminary Reassessment

EPA, November 1992: Hazard Ranking System Guidance Manual---Evaluation of Sites with Waste Removals.

EPA Region IV, 12/2/1988: Inspection to Assess Compliance with Closure / Post Closure Requirements Report

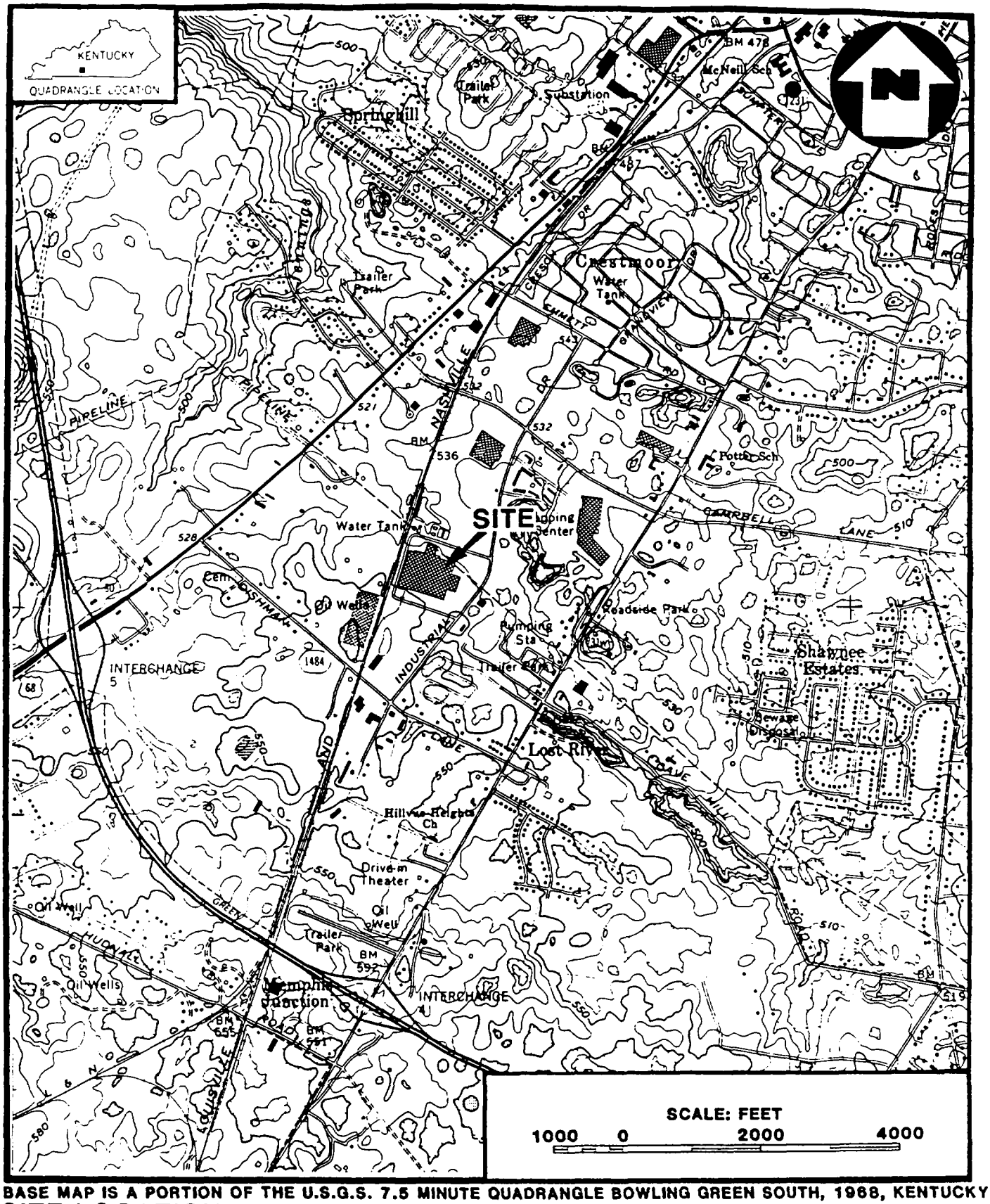
NUS Corporations, 3/13/1990: Environmental Priorities Initiative Preliminary Assessment.

Crawford 9/17/1985: Dye Traces of Loading Ramp Drainage Well and Paint Vats at D.E.S.A. Corporation.

KYDWM 4/30/1998: Record of Communication, Hogan.

OVERSIZED

DOCUMENT

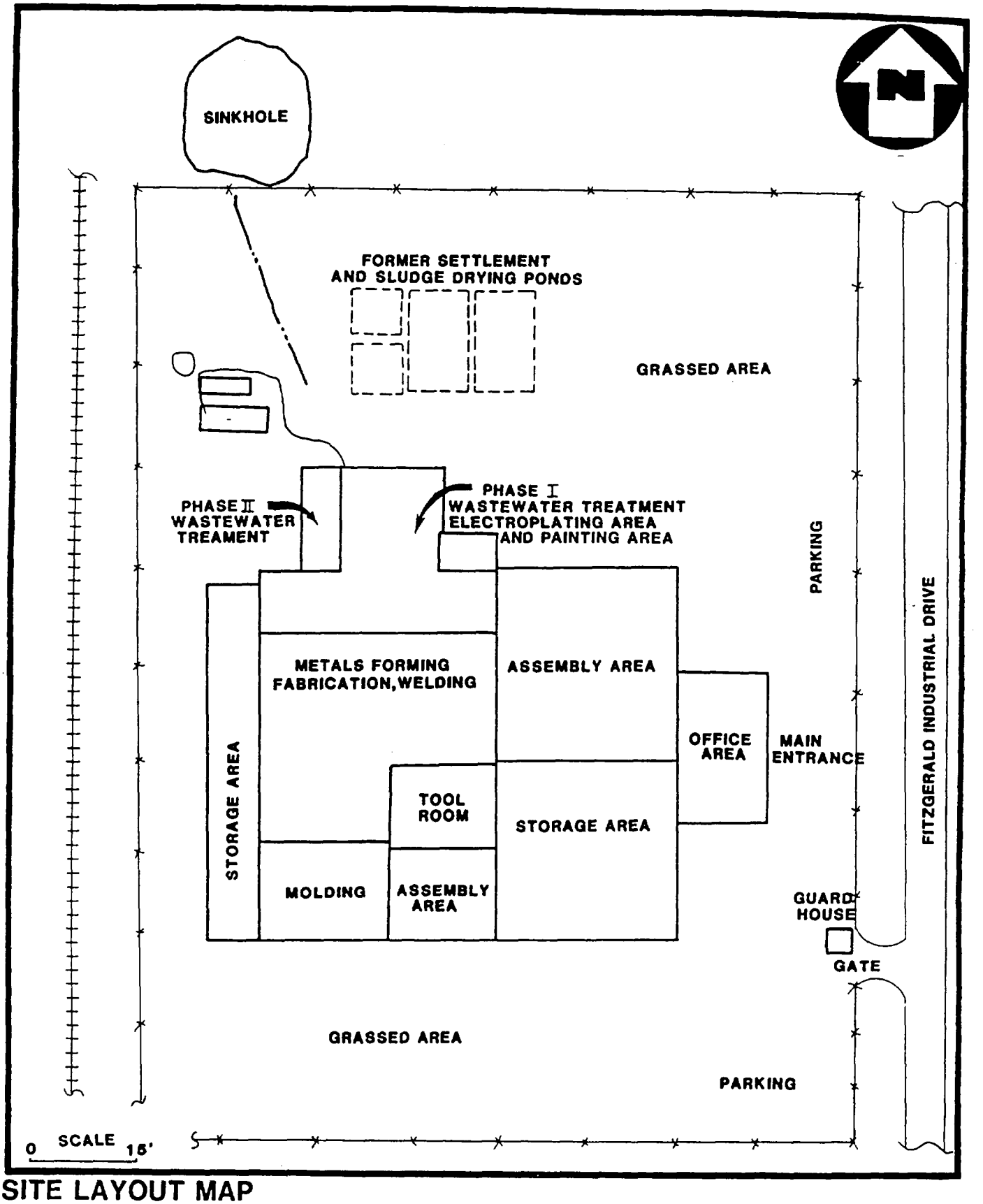


BASE MAP IS A PORTION OF THE U.S.G.S. 7.5 MINUTE QUADRANGLE BOWLING GREEN SOUTH, 1968, KENTUCKY.

SITE LOCATION MAP
EATON CORPORATION
BOWLING GREEN, WARREN COUNTY, KENTUCKY

FIGURE 2-1

NUS CORPORATION



SITE LAYOUT MAP
EATON CORPORATION
BOWLING GREEN, WARREN COUNTY, KENTUCKY

FIGURE 2-2

NUS CORPORATION

JACKIE SWIGART
SECRETARY

JOHN Y. BROWN, JR.
GOVERNOR

COMMONWEALTH OF KENTUCKY
DEPARTMENT FOR NATURAL RESOURCES AND ENVIRONMENTAL PROTECTION
BUREAU OF ENVIRONMENTAL PROTECTION

November 24, 1982

Letter of Warning

Mr. M. H. Smith
Senior Project Engineer
Eaton Corporation
Post Office Box 1158
Bowling Green, Kentucky 42101

Dear Mr. Smith:

It has recently been determined that certain deficiencies exist in the operation of the Eaton Corporation hazardous waste facility KYD098950306 located in Bowling Green. I discussed these deficiencies with you during our meeting of November 23, 1982. The purpose of this letter is to formally notify you of these deficiencies and that these deficiencies are in violation of the Kentucky Hazardous Waste regulations 401 KAR 2:073 Section 10 which have adopted and filed by reference the Federal Regulation 40 CFR 265 subpart K applying to surface impoundments. The deficiencies are as follows:

1. Failure to inspect the surface impoundment on a daily basis to determine freeboard level (40 CFR 265.226 (a) (1).

2. Failure to inspect the surface impoundment including dikes and vegetation surrounding the dike, at least once a week to detect any leaks, deterioration or failures in the impoundment (40 CFR 265.226 (a) (2).

3. Failure to maintain a written schedule of inspections (40 CFR 265.15 (b).

4. Failure to maintain an inspection log (40 CFR 265.15 (d).

I recommend that the above deficiencies be corrected immediately. An inspection will be made of this facility in the near future to determine compliance. Also, a preliminary investigation as a result of a complaint has revealed that one of the surface impoundments at this facility may be leaking. In view of the above deficiencies, I recommend that you make every

2nd copy to S.J.

possibly effort to determine if the surface impoundment is leaking and take immediate corrective action if it is determined to be leaking. Please advise me of your intentions in this matter. It is the intention of this division to continue investigating this situation and take whatever action necessary to assure protection of the environment.

If you have any questions concerning this matter or if I may be of some assistance to you, please feel free to contact me at this office.

Sincerely,

Donald R. Curry
Envir. Control Area Supervisor
Division of Waste Management
P. O. Box 335
Columbia, Kentucky 42728
Phone (502) 384-4735

DRC/jgh

cc: Carl Schroeder
Jack Watkins
Art Curtis
Bob Adams
Dave Adams

File

M E M O R A N D U M

TO: Carl Schroeder, Manager
Field Operations Branch
Division of Waste Management

FROM: Donald R. Curry
Division of Waste Management
Columbia Field Office

DATE: December 1, 1982

RE: Eaton Corporation/Cutler Hammer
Warren County

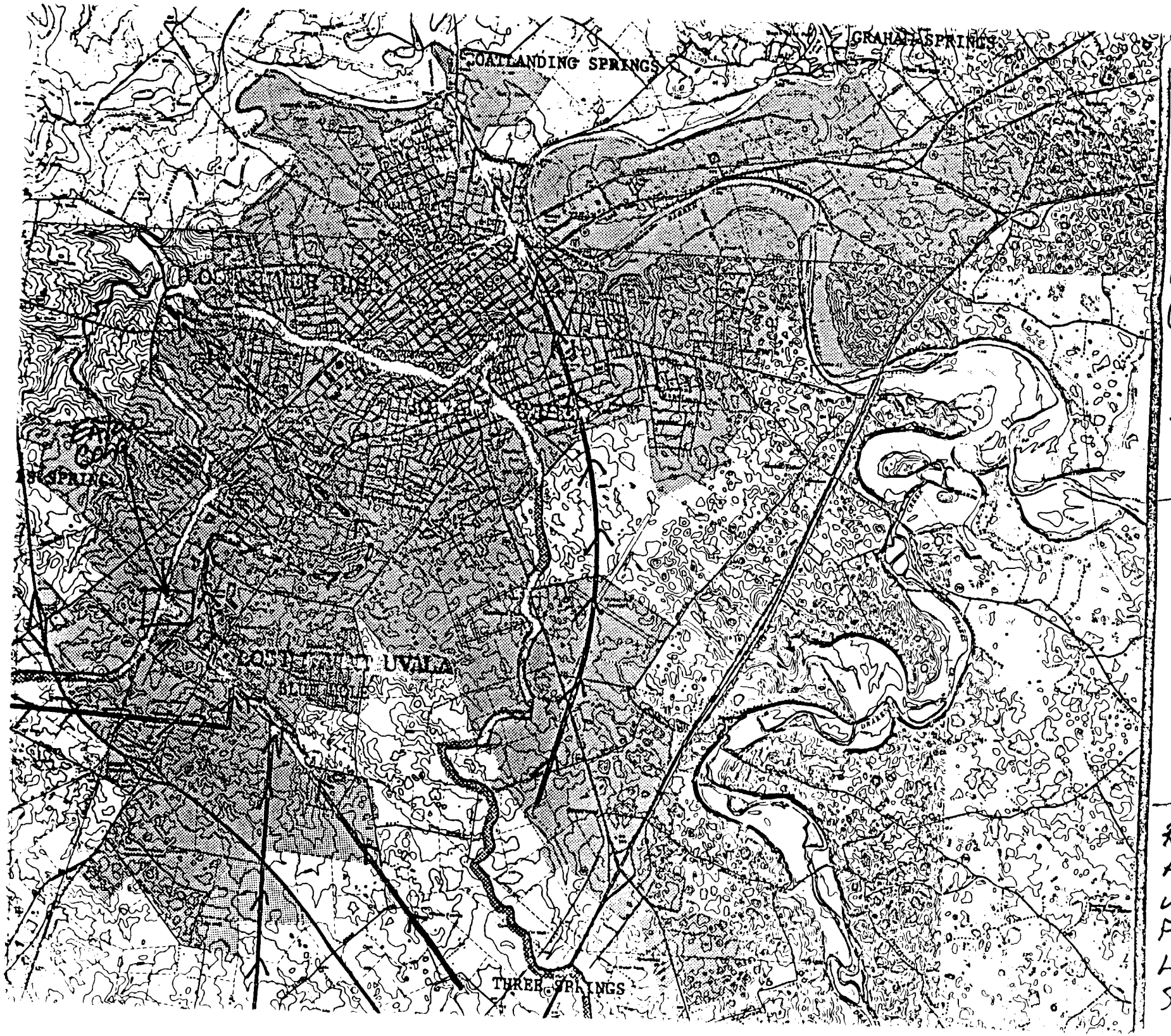
As you know on November 23, 1982, Jack Watkins and I visited the above company. This company is registered as a hazardous waste facility and has four storage and/or treatment surface impoundments at the plant site which contain hazardous wastes. A recent investigation was made by the Division of Water as a result of a complaint from two Western Kentucky University students. The students apparently are doing research on the underground Lost River System in Bowling Green and found some chemical seepage from the roof of the cave very near the location of the Cutler Hammer surface impoundments.

As you know samples were taken in various locations by the Division of Water which have shown contamination of this Lost River System. The contamination resembles the contents of the Cutler Hammer surface impoundments. Also, during our visit to the surface impoundments we observed that the level of the contents in one was somewhat lower than the level of an adjacent surface impoundment although both appeared to be at the same ground level.

As you know according to the hazardous waste regulations this level is to be monitored daily and the information maintained in a log. Mr. Mel Smith of Cutler Hammer indicated that no such monitoring has been done. I made Mr. Smith aware of the requirements verbally and by letter (see attached letter).

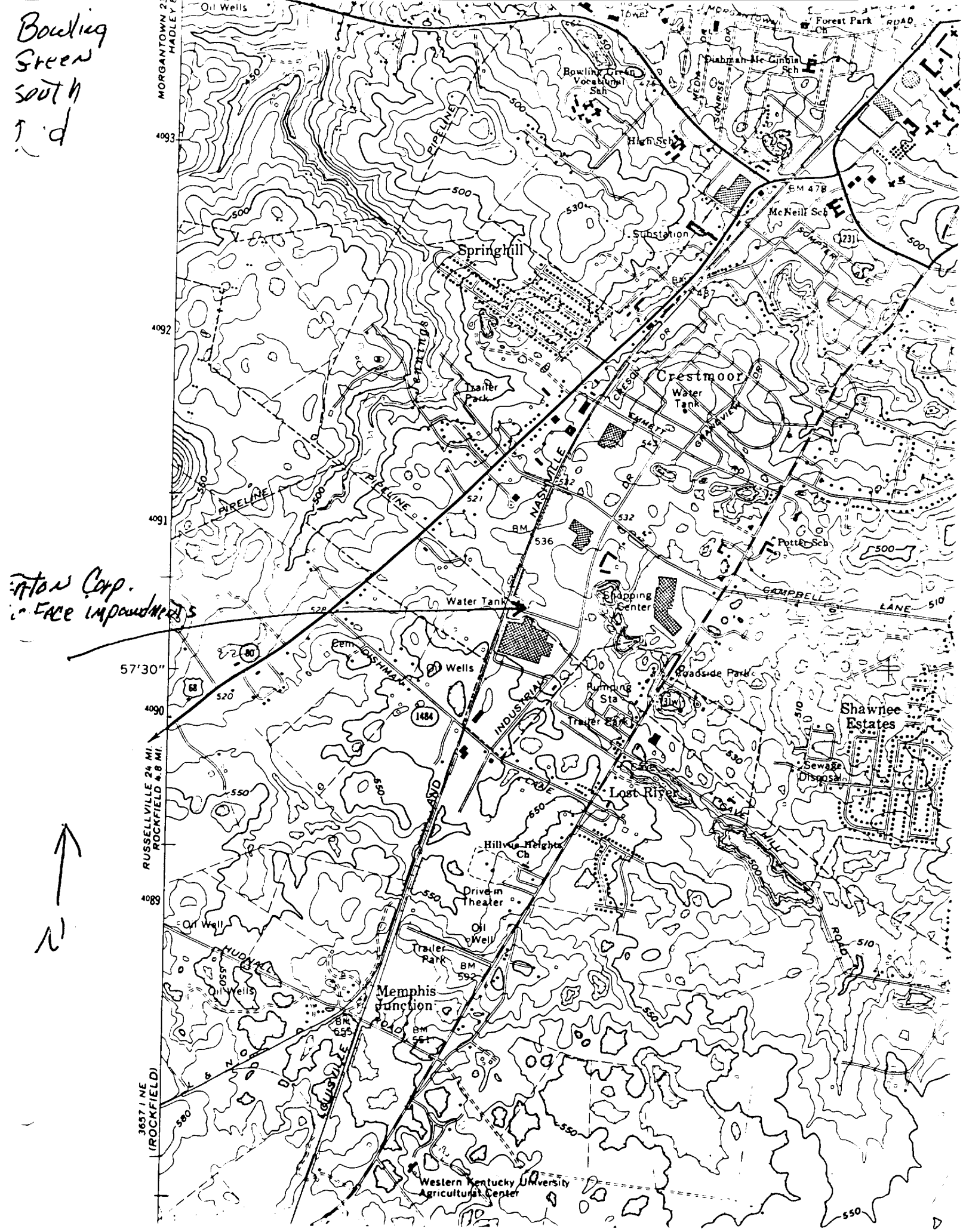
In view of our preliminary investigation and the test results from the Division of Water investigation, I feel that a dye test is necessary to determine if the surface impoundment is leaking. Therefore, I request assistance from the Compliance Branch in implementing the dye test.

DRC/jgh
cc: Jack Watkins
Curt Curtis
Pat Haight



The Lost River Groundwater Basin Map Warren County by Dr. Nick Crawford WKU

Red indicate Approximate underground Flow of Lost River System


Bowling Green South Rd
Oil Wells
Forest Park
Bowling Green Vocational Sch
Dishman-McGinnis Sch
High Sch
BM 478
McNeill Sch
Substation
Springhill
Crestmoor
Water Tank
Trailer Park
PIPELINE
NASHVILLE
CAMPBELL LANE
Potter Sch
Shopping Center
Water Tank
Cemetery
Oil Wells
Roadside Park
Running Sta
Trailer Park
INDUSTRIAL
Shawnee Estates
Sewage Disposal
Lost River
Hillview Heights Ch
Drive-in Theater
Oil Well
Trailer Park
BM 592
Memphis Junction
BM 655
BM 561
Oil Wells
Western Kentucky University Agricultural Center
RUSSELLVILLE 24 MI.
ROCKFIELD 4.8 MI.
3657 I NE (ROCKFIELD)
4093
4092
4091
4090
4089
57'30"
Fenton Corp.
Face impoundments
N

Record of Communication

☒ PHONE CALL ☐ DISCUSSION ☐ ON-SITE
☐ CONFERENCE ☐ OTHER ☐ ON-CALL

TO: HAL HACKETT
FROM: JACK WATKINS
DATE: 11/17/82
TIME: 1:15 pm

SUBJECT: EATON CORP. Cutler-Hammer Div., BOWLING GREEN

SUMMARY OF COMMUNICATION: KYD098950306

Surface impoundment at this facility has lost all free liquid, apparently very recently.

Sludge is reported to be showing up in the cave system beneath the site.

Samples of SI and cave have been taken by Div. of Water.

HWH 11/17/82

CONCLUSIONS, ACTION TAKEN OR REQUIRED:

Advised Jack of applicable 265 regs ie. 40 CFR 265.15(c)

Will call him back

INFORMATION COPIES TO:

DEP1008

JACKIE SWIGART
SECRETARY

JOHN Y. BROWN, JR.
Governor

COMMONWEALTH OF KENTUCKY
NATURAL RESOURCES AND ENVIRONMENTAL PROTECTION CABINET
DEPARTMENT FOR ENVIRONMENTAL PROTECTION
FORT BOONE PLAZA
18 REILLY ROAD
FRANKFORT, KENTUCKY 40601

March 9, 1983

File Copy

Mr. H.M. Smith
Senior Project Engineer
Eaton Corporation
P.O. Box 1158
Bowling Green, Kentucky 42101

RE: Hazardous Waste Surface Impoundments, EPA I.D. #KYD09-895-0306

Dear Mr. Smith:

The Division of Waste Management has reviewed the inspection log kept on your surface impoundment from November 30, 1982 thru Janaury 26, 1983. From these records and other information on the surface impoundments, the Division noted some discrepancies in accounting for the variations in liquid levels in the impoundments.

The following are three major areas of concern:

1. There is no inlet or outlet to or from the sludge basins except for the overflow pipe. Therefore, these sludge basins cannot discharge any liquid other than through the overflow. A subsurface investigation report prepared by Daugherty, Trautwein and Harris, Inc. in September-October 1981 shows the liquid levels in the two sludge basins to be the same. However, on November 30, 1982 there is a 7.75 inch difference in the levels of the two sludge basins, the south basin being the lower. This difference cannot be explained with any information available at the present time, unless the basin leaked and liquid was lost through the bottom.

2. The discharge outlet from the lagoons has been sealed since December 7, 1982 and there has been no waste discharged into them since June 15, 1981. Between December 7 and 28 of 1982, the south basin has gained 6" of liquid and the west sludge pond has gained 6.25 inches. Neglecting the evaporation losses, the variations in liquid levels cannot be explained by considering rainfall and overflow alone.

This Division has done some water balance calculations to account for the rainfall accumulations between December 7th and 28th, 1982. The calculations have been based on a total rainfall of 4.71 inches between December 7, and 28, 1982 and assumed that the measurements recorded on your inspection log have been taken from top of the overflow pipe in the sludge pond and from the invert level of the outlet trough in the west sludge basin.

The calculated results were then compared with the recorded levels shown on your log. The calculated rise in south sludge basin due to the recorded rainfall is 5.4 inches, while the recorded rise was 6" which compares fairly well with the calculated figure considering errors in measurement and evaporation. On the other hand the calculated increase in level in the west sludge pond is 8.76 inches, the actual rise was only 6.25 inches. This difference of 2.5 inches amounts to 2927 cu. ft. of water which is a significant volume of water that cannot be accounted for.

3. During this same period of December 7th thru 28th, 1982, the east sludge pond gained only (17.87 - 15.25) 2.62 inches. Considering there is no inlet, outlet, or any overflow into this pond, the level in this pond should have risen at least 4.71 inches due to rainfall. This difference cannot be explained from the information available at this time.

These discrepancies led the Division to suspect that some or all of the surface impoundments may be losing liquid through the bottom.

You are therefore referred to Mr. Don Curry's letter dated Novmeber 24, 1981 and requested to inform the Division concerning your determination of the integrity of the surface impoundments and of corrective action that you have taken.

If the integrity of the surface impoundments cannot be assured beyond reasonable doubt you will be required to close the surface impoundments according to an approved closure plan under the provisions of 401 KAR 2:063 Section 6(4). Please advise the Division of your plans within 10 days of receipt of this letter.

If you have any questions, please feel free to contact this office.

Sincerely,

Caroline Patrick Haight

Caroline Patrick Haight
Manager, Permit Review Branch
Division of Waste Management

CPH:MA:cg

cc: Don Curry, Area Supervisor

MEMORANDUM

TO: Caroline P. Haight, Manager
Permit Review Branch

FROM: Barry Burrus, Chief
Uncontrolled Sites Section

DATE: March 21, 1984

SUBJECT: Uncontrolled Site Close-out for the Eaton Corporation,
Bowling Green Plant - Warren County

This facility produces relay-type electrical motor switchgear for industrial applications. Wastes generated at this facility include: electroplating sludge, water-based paint wastes, paint wastes, used lubricating oil, and used chlorinated solvents.

The electroplating sludge is first treated with lime, acid, and a polyelectrolyte. It is then filter pressed to produce a "cake" which is disposed in a hazardous waste disposal site, operated by NEWCO Chemical Waste Systems of Ohio, Inc.

Water-based paint wastes, and paint wastes (containing no metals) are disposed on a quarterly basis.

Used lubricating oil and used chlorinated solvents are reclaimed on a quarterly basis.

The electroplating sludges are contained in lagoons prior to treatment. This practice is planned to be eliminated by an in-line filter cake process. Closure of the lagoons will begin in July, 1984.

After research of the KYNREPC files and the completion of a preliminary assessment by Robert Burns, I have concluded that this site requires no further action and should be removed from the uncontrolled sites list.

BB:RB:da

cc: Don Curry
Jack Watkins
Bob Prewitt
Robert Burns
File

POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 1 - SITE INFORMATION AND ASSESSMENT

EPA

I. IDENTIFICATION
01 STATE: KY | 02 SITE NUMBER: KYD098950306

II. SITE NAME AND LOCATION

01 SITE NAME (Legal, common, or descriptive name of site)	02 STREET, ROUTE NO., OR SPECIFIC LOCATION IDENTIFIER
Eaton Corp, Bowling Green Plt.	P.O. Box 1158, 2901 Fitzgerald Ind Drive

03 CITY	04 STATE	05 ZIP CODE	06 COUNTY	07 COUNTY CODE	08 CONG DIST
Bowling Green	KY	42101	Warren	114	

09 COORDINATES LATITUDE	LONGITUDE
36°57 03.0"	086°29 00.2"

10 DIRECTIONS TO SITE (Starting from nearest public road)
From Bowling Green follow Creson Drive to Emmett Rd. Take a left on to Emmett Road. Approximatey 1/4 mile down Emmett Rd. take a right on to Industrial Drive, facility is about 1/2 mile down Industrial Drive on the right.

III. RESPONSIBLE PARTIES

01 OWNER (If known)	02 STREET (Business, mailing, residential)
Eaton Corporation	100 Erieview Plaza 1111 Superior Ave

03 CITY	04 STATE	05 ZIP CODE	06 TELEPHONE NUMBER
Cleveland	Oh	44114	(216) 523-5000 2597

07 OPERATOR (If known and different from owner)	08 STREET (Business, mailing, residential)
Mel Smith	P.O. Box 1158, 2901 Fitzgerald Ind Drive

09 CITY	10 STATE	11 ZIP CODE	12 TELEPHONE NUMBER
Bowling Green	KY	42101	(502) 782-1555

13 TYPE OF OWNERSHIP (Check one)
☑ A. PRIVATE ☐ B. FEDERAL: _____ (Agency name) ☐ C. STATE ☐ D. COUNTY ☐ E. MUNICIPAL
☐ F. OTHER: _____ (Specify) ☐ G. UNKNOWN

14 OWNER/OPERATOR NOTIFICATION ON FILE (Check all that apply)
☐ A. RCRA 3001 DATE RECEIVED: ___/___/___ (MONTH DAY YEAR) ☐ B. UNCONTROLLED WASTE SITE (CERCLA 103 c) DATE RECEIVED: ___/___/___ (MONTH DAY YEAR) ☑ C. NONE

IV. CHARACTERIZATION OF POTENTIAL HAZARD

01 ON SITE INSPECTION
☑ YES DATE 2 / 15 / 84 (MONTH DAY YEAR)
☐ NO

BY (Check all that apply)
☐ A. EPA ☐ B. EPA CONTRACTOR ☑ C. STATE ☐ D. OTHER CONTRACTOR
☐ E. LOCAL HEALTH OFFICIAL ☐ F. OTHER: _____ (Specify)
CONTRACTOR NAME(S): _____

02 SITE STATUS (Check one)
☑ A. ACTIVE ☐ B. INACTIVE ☐ C. UNKNOWN

03 YEARS OF OPERATION
BEGINNING YEAR _____ ENDING YEAR _____ ☑ UNKNOWN

04 DESCRIPTION OF SUBSTANCES POSSIBLY PRESENT, KNOWN, OR ALLEGED
Electroplating wastes, water-based paint wastes, paint wastes, used lubricating oil, and used chlorinated solvents.

05 DESCRIPTION OF POTENTIAL HAZARD TO ENVIRONMENT AND/OR POPULATION
This facility has four lagoons that contain electroplating wastewater treatment sludge. These lagoons are planned for closure in July, 1984.

V. PRIORITY ASSESSMENT

01 PRIORITY FOR INSPECTION (Check one. If high or medium is checked, complete Part 2 - Waste Information and Part 3 - Description of Hazardous Conditions and Incidents)
☐ A. HIGH (Inspection required promptly) ☐ B. MEDIUM (Inspection required) ☐ C. LOW (Inspect on time available basis) ☑ D. NONE (No further action needed, complete current disposition form)

VI. INFORMATION AVAILABLE FROM

01 CONTACT	02 OF (Agency/Organization)	03 TELEPHONE NUMBER
Jack Watkins	KYDREPC, Columbia Field Office	(502) 384-4234

04 PERSON RESPONSIBLE FOR ASSESSMENT	05 AGENCY	06 ORGANIZATION	07 TELEPHONE NUMBER	08 DATE
Robert Burns	Env. Prot.	Waste Mgt.	(502) 564-6716	3 / 19 / 84 (MONTH DAY YEAR)

EPA FORM 2070-12 (7-81)

EPA

POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 2 - WASTE INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
KY	D098950306

II. WASTE STATES, QUANTITIES, AND CHARACTERISTICS

01 PHYSICAL STATES (Check all that apply)

- ☐ A. SOLID
- ☐ B. POWDER, FINES
- ☐ C. SLUDGE
- ☐ D. OTHER NA (Specify)
- ☐ E. SLURRY
- ☐ F. LIQUID
- ☐ G. GAS

02 WASTE QUANTITY AT SITE (Measures of waste quantities must be independent)

TONS NA

CUBIC YARDS

NO. OF DRUMS

03 WASTE CHARACTERISTICS (Check all that apply)

- ☐ A. TOXIC
- ☐ B. CORROSIVE
- ☐ C. RADIOACTIVE
- ☐ D. PERSISTENT
- ☐ E. SOLUBLE
- ☐ F. INFECTIOUS
- ☐ G. FLAMMABLE
- ☐ H. IGNITABLE
- ☐ I. HIGHLY VOLATILE
- ☐ J. EXPLOSIVE
- ☐ K. REACTIVE
- ☐ L. INCOMPATIBLE
- ☒ M. NOT APPLICABLE

III. WASTE TYPE

CATEGORY	SUBSTANCE NAME	01 GROSS AMOUNT	02 UNIT OF MEASURE	03 COMMENTS
SLU	SLUDGE			
OLW	OILY WASTE			
SOL	SOLVENTS			
PSD	PESTICIDES	NA		
OCC	OTHER ORGANIC CHEMICALS			
IOC	INORGANIC CHEMICALS			
ACD	ACIDS			
BAS	BASES			
MES	HEAVY METALS			

IV. HAZARDOUS SUBSTANCES (See Appendix for most frequently cited CAS Numbers)

01 CATEGORY	02 SUBSTANCE NAME	03 CAS NUMBER	04 STORAGE/DISPOSAL METHOD	05 CONCENTRATION	06 MEASURE OF CONCENTRATION
	NA				

V. FEEDSTOCKS (See Appendix for CAS Numbers)

CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER	CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER
FDS			FDS		
FDS			FDS		
FDS			FDS		
FDS			FDS		

VI. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

State files

EPA

POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION
01 STATE: KY | 02 SITE NUMBER: D098950306

II. HAZARDOUS CONDITIONS AND INCIDENTS

01 ☐ A. GROUNDWATER CONTAMINATION
03 POPULATION POTENTIALLY AFFECTED: NA
02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ B. SURFACE WATER CONTAMINATION
03 POPULATION POTENTIALLY AFFECTED: NA
02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ C. CONTAMINATION OF AIR
03 POPULATION POTENTIALLY AFFECTED: NA
02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ D. FIRE/EXPLOSIVE CONDITIONS
03 POPULATION POTENTIALLY AFFECTED: NA
02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ E. DIRECT CONTACT
03 POPULATION POTENTIALLY AFFECTED: NA
02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ F. CONTAMINATION OF SOIL
03 AREA POTENTIALLY AFFECTED: NA (Acres)
02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ G. DRINKING WATER CONTAMINATION
03 POPULATION POTENTIALLY AFFECTED: NA
02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ H. WORKER EXPOSURE/INJURY
03 WORKERS POTENTIALLY AFFECTED: NA
02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ I. POPULATION EXPOSURE/INJURY
03 POPULATION POTENTIALLY AFFECTED: NA
02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

EPA

POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION
01 STATE: KY | 02 SITE NUMBER: KYD098950306

II. HAZARDOUS CONDITIONS AND INCIDENTS (Continued)

01 ☐ J. DAMAGE TO FLORA
04 NARRATIVE DESCRIPTION: NA
02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED

01 ☐ K. DAMAGE TO FAUNA
04 NARRATIVE DESCRIPTION (Include name(s) of species): NA
02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED

01 ☐ L. CONTAMINATION OF FOOD CHAIN
04 NARRATIVE DESCRIPTION: NA
02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED

01 ☐ M. UNSTABLE CONTAINMENT OF WASTES
(Spills/runoff/standing liquids/leaking drums)
03 POPULATION POTENTIALLY AFFECTED: NA
02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ N. DAMAGE TO OFFSITE PROPERTY
04 NARRATIVE DESCRIPTION: NA
02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED

01 ☐ O. CONTAMINATION OF SEWERS, STORM DRAINS, WWTPs
04 NARRATIVE DESCRIPTION: NA
02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED

01 ☐ P. ILLEGAL/UNAUTHORIZED DUMPING
04 NARRATIVE DESCRIPTION: NA
02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED

05 DESCRIPTION OF ANY OTHER KNOWN, POTENTIAL, OR ALLEGED HAZARDS
NA

III. TOTAL POPULATION POTENTIALLY AFFECTED: _____

IV. COMMENTS

V. SOURCES OF INFORMATION (Cite specific references, e. g., state files, sample analysis, reports)

CLOSURE PLAN
WASTEWATER SETTLING PONDS AND SLUDGE BEDS
EATON CORPORATION
INDUSTRIAL CONTROL DIVISION
BOWLING GREEN, KENTUCKY

JOB NO. 12461-007-17
JUNE 11, 1984

Dames & Moore

TABLE OF CONTENTS

I hereby certify that this plan for the closure of the settling ponds and sludge beds at Eaton Corporation, Industrial Control Division's Bowling Green, Kentucky plant was prepared under by direct supervision.

Stuart Edwards
Registered Professional Engineer
No. 13439

INTRODUCTION

The water treatment system at the Eaton Corporation, Industrial Control Division facility in Bowling Green, Kentucky includes four wastewater treatment impoundments which are considered as hazardous waste facilities under the 1976 Resource Conservation and Recovery Act (RCRA). These are presently regulated under Interim Status by the Kentucky Administrative Regulations, 401 KAR 35 standards.

A Phase II waste treatment system was brought "on-line" on June 15, 1981 (negating the further need for surface impoundments), and no additional wastes have been placed in the impoundments since that date. This new system resulted in:

1. A considerable amount of reuse water
2. Discharge to the POTW of filtrate (which is monitored by the POTW and Eaton) under a permit with them
3. The production of filter cake with disposal in a secure site in accordance with all applicable Kentucky DNR regulations

This plan is designed to permit closure under the Interim Status standards and, as such, remove the facility from further regulation as a hazardous waste management facility. Closure is to be accomplished by removing all the impounded materials and contaminated soils as per 401 KAR 35:200(6) (Closure and Post-Closure Surface Impoundments). Site closure to meet these requirements involves the following general components:

- Pumping of free liquids, if any
- Cleaning out of accumulated sludges
- Removal of contaminated soil, if any
- Site grading compatible with future anticipated land use

SITE DESCRIPTION

Eaton Corporation's Industrial Control Division facility is located approximately 1 mile south of Bowling Green in the Mississippian Plateau area of Kentucky. This area is a slightly rolling karst plain characterized by few streams and numerous sinkholes.

The ground surface in the wastewater treatment area is essentially level due to grading during plant construction when up to 7 feet of fill was placed to bring the ground elevation to approximately 37 feet (plant datum). The impoundments were then constructed within the fill and the upper few feet of natural soils. North of the impoundment dikes, the ground surface slopes to a lake on the plant property.

The soils overlying bedrock at this site consist of up to 7 feet of clay fill, and original surficial clay soils up to 7 feet thick. The underlying bedrock consists of the Ste. Genevieve Limestone of Upper Mississippian age. The limestone is light gray and contains numerous voids and fractures. This limestone is the uppermost water-bearing zone at the site where ground water occurs within the fractures and voids.

Natural shallow ground water in the vicinity of the wastewater treatment facilities is generally suitable for use as a water supply. The ground water sampling program has shown that there is no evidence of the hazardous waste constituents (nickel or cyanide) in the ground water (Appendix B, RCRA Ground Water Monitoring Semi-Annual Report).

FACILITY CHARACTERISTICS

The impoundments consist of two settling ponds where relatively clean water--possibly containing some precipitated metals--was discharged to one of the ponds so that the precipitated material could settle. The ponds served as clarifiers.

This system also provided two sludge beds to which the sludges generated in the batch treatments, and those drawn from the bottom of the closed loop reservoirs were directed for settling and thickening. The

overflow from the sludge beds was directed to the settling ponds before discharge.

The two settling ponds are essentially rectangular, approximately 142 feet long and 82 feet wide (Plate 1). Plot plans of the area from Eaton records show the ponds to be surrounded by a perimeter dike, the top elevation of which is 37 feet plant datum. Side slopes are 1V (vertical):3H (horizontal) on both the interior and exterior sides. The area between the two ponds is essentially flat, with an elevation of approximately 37 feet plant datum and separates the ponds by about 10 feet. Original construction drawings (Eaton Drawing CG-4) for the ponds show that the bottom elevations were designed to be 30 feet plant datum. The impoundments were constructed with a 12-inch compacted clay liner overlying a 4-mil PVC artificial liner. The entire hazardous waste facility is presently covered by an air support structure to prevent water accumulation in the impoundments which have been pumped of standing water.

A pipe system extending from the plant supplied effluent to both ponds. Discharge of effluent into each pond was accomplished through lateral piping off the distribution box. Effluent flowed through the basins, and treated water was then discharged through the distribution box into a 6-inch steel galvinized corrugated pipe to the lake under a permit issued by the Division of Water Quality. General characteristics of the ponds are shown on Plate 1. Sludge contained in the two ponds is estimated at the following volumes:

East pond	583 cubic yards
West pond	990 cubic yards
	1,573

The sludge beds consist of two essentially rectangular areas. Each bed measures 80 feet in length and 65 feet in width with 1V:3H interior and exterior slopes. The crest of the perimeter dike is at an elevation of 37 feet plant datum, and the beds are separated by a 10-foot-wide center dike. Sludge estimates indicate that the beds contain the following volumes:

North beds	288 cubic yards
South beds	288 cubic yards
	576

The chemical characteristics of the sludge have been evaluated (laboratory analysis provided by Eaton, see Appendix C), indicating the following total metallic concentrations based upon sampling performed on May 11, 1981:

	Concentration (ppm)	
	Composite 1[1]	Composite 2[2]
Cadmium	210	210
Chromium (total)	750	725
Copper	625	675
Nickel	840	880
Lead	37.5	37.5
Zinc	2,500	4,750
Silver	0.55	0.57
Tin	150	140
Barium	110	135

EP toxicity results on the sludge from the same event were:

	Concentration (ppm)	
	Composite 1[1]	Composite 2[2]
Barium	7.0	9.0
Cadmium	3.2	7.5
Chromium	0.45	0.45
Arsenic	0.025	0.040
Tin	<0.005	<0.005
Lead	<0.5	<0.5
Mercury	0.0011	<0.0002
Silver	0.12	0.10

Physical tests by CECOS in May 1984 indicate that the sludge, prior to any dewatering efforts, has a unit weight of 64.3 to 66.1 pounds per cubic foot.

CLOSURE PLAN

Closure of the wastewater treatment ponds and sludge beds will be conducted by CECOS Environmental employing sludge-handling methods and procedures to provide the maximum safety to onsite personnel, while maintaining total compliance with local, state, and federal regulations. This is done by using trained professionals equipped with proper safety equipment.

[1] Composite from north sludge bed.
[2] Composite from south sludge bed.

Closure of the basins will consist of:

1. The air support structure will be removed. Plastic sheeting will be placed over the impoundments to prevent contamination during removal. The sheeting will then be disposed of in the offsite hazardous waste landfill.

2. Influent piping from the plant to both the sludge beds and settling ponds will be flushed from the building with high caustic-content soap and water to emulsify any sediment, followed by a water rinse. All rinse-out liquids will be directed to the plant treatment system. The piping will then be plugged at both the plant end and near the distribution boxes.

3. The sludge will be stabilized by solidifying with lime kiln flue dust.[3] Estimated volumes and weight for the four beds is:

   A. North and South Sludge Beds

Estimated total volume	576 cubic yards
Estimated bulk density	1,735 pounds/cubic yard
Total weight	499.7 tons
Pozzalime requirements	150 tons (30 percent wt/wt)
Total weight for disposal	649.7 tons

   B. West Settling Pond

Estimated total volume	990 cubic yards
Estimated bulk density	1,785 pounds/cubic yard
Total weight	883.6 tons
Pozzalime requirements	220 tons (25 percent wt/wt)
Total weight for disposal	1,103.6 tons

   C. East Settling Pond

Estimated total volume	583 cubic yards
Estimated bulk density	1,825 pounds/cubic yard
Total weight	541.1 tons
Pozzalime requirements	90 tons (17 percent wt/wt)
Total weight for disposal	631.1 tons

   D. Clay Liner

Estimated total volume	1,248 cubic yards
Estimated bulk density	2,500 pounds/cubic yard
Total weight for disposal	1,560 tons

The stabilized sludge, 12-inch compacted clay liner, and artificial liner will be removed to the CECOS approved hazardous waste landfill for disposal. As a generator of hazardous waste, all

[3] Lime kiln flue dust is marketed under the trade name Pozzalime by Mineral By-Products, Inc., 8070 Condor Court, Centerville, OH 45459 (513) 435-3194.

applicable requirements of 40 CFR 262, 263, and 265 will be observed. These requirements cover manifesting the material to be transported and reporting protocols.

The following materials, equipment, and manpower will be used for the sludge solidification, excavation, transportation, and disposal:

A. Equipment van
B. Chemical technician
C. Backhoe with operator
D. Loader with operator
E. Personal safety equipment
F. All materials required for construction of the truck cleaning station
G. High-pressure spray cleaner
H. High calcium oxide pozzalime

CECOS Environmental shall also supply the required bulk trailers for transport of the solidified material.

A truck and equipment cleaning station will be constructed onsite the first working day for removal of any exterior contamination on all vehicles leaving the project area. This station will be a double-lined gravel pit 60 feet by 10 feet by 6 to 8 inches deep. All wash fluids will be collected as they accumulate and pumped to the impoundment area or to wastewater treatment facilities as directed by Eaton. After project completion, this wash station will be removed and disposed of as hazardous at CECOS Secure Chemical Management Facility.

Both the backhoe and loader will be utilized the first and second working day to accumulate an inventory of solidified material (no free liquid, no slump) and all visually detectable contaminated soil.

Solidification will begin in either the north or south sludge bed. Solidification and excavation procedures will be comparable at all four impoundment areas regardless of the starting point.

Loading of bulk trailers will commence the third working day between 8:00 a.m. and 2:45 p.m. The loader will be utilized primarily for this function, with the backhoe solidifying and providing stockpiled material for loading.

Stockpiled material will be allowed to cure for approximately 48 hours prior to loading. Utilizing this approach provides the most efficient use of solidification agent.

All sludge materials and clay liner will be removed in 8 days after the 2 days of solidifying and stockpiling. To accomplish this, CECOS Environmental will be removing approximately 24 trucks per day.

4. At the completion of excavation of all the contained sludge, clay, and artificial liner in each impoundment area, CECOS Environmental shall grid each impoundment at 30-foot intervals resulting in four samples from within both the south and north sludge beds and eight from within the west and east settling ponds. Each sample will consist of 2-foot-deep plug samples, extracted, and isolation of samples at the surface and 6-inch intervals. All samples will be properly containerized and logged per chain-of-custody requirements for shipment to CECOS Environmental's subcontracted laboratory in Dayton, Ohio.

   The following methodology will be used for analysis of samples:

   A. Surface samples: analysis of all samples for EP toxicity and cyanide

   B. Each 6-inch sample, as required: analysis of samples for parameters above RCRA limits as determined by analysis of the surface samples

   If the results indicate that mobile contaminants have penetrated below the impoundment bottom, excavation will be conducted to ensure removal of contaminated soil.[4] The backhoe and loader will be utilized to remove 6-inch "lifts" as required, excavating and loading approximately 26 truckloads per day. As such, each 6-inch lift can be removed in 1-1/2 working days.

5. All influent and effluent distribution boxes will be treated as hazardous and removed to the landfill. The 6-inch effluent pipe will be removed, crushed, and used as fill in the final grading.

6. Final grading will consist of returning the site to approximate original contour as shown on Plate 1, followed by revegetation.

7. The ground water monitoring system will be removed, and the wells plugged with concrete after final certification and approval.

8. All equipment used in removal of contaminated soil and filter material (backhoe) will be steam-cleaned at the site, with the water being directed to the waste treatment facility.

GROUND WATER MONITORING

Ground water monitoring will be continued during the closure period in accordance with the sampling and analysis plan (Appendix A, Ground Water

[4] Contaminated soil is defined as soil that is classified as hazardous using the EP toxicity test.

Sampling and Analysis Plan) if closure has not been completed and certification approved prior to the semi-annual sampling event scheduled for August 1984.

Monitoring wells will be maintained during closure activities, and any refitting necessary due to regrading will be performed to ensure ground water monitoring capabilities. Following certification and final approval by the Department of Natural Resources and Environmental Protection, all monitoring wells will be plugged and surface expression removed.

CLOSURE CERTIFICATION

Closure certification will be provided by Eaton Corporation and by an independent professional engineer (Dames & Moore, Cincinnati, Ohio) upon completion. These certifications are to ensure that closure is done in accordance with the approved closure plans. To enable the independent engineer to certify the closure, periodic field observation will be required during key closure activities.

SCHEDULE

Closure will commence upon Department of Natural Resources final approval of this closure plan, with completion within 14 working days of stabilization and removal.

APPENDIX A
GROUND WATER SAMPLING AND ANALYSIS PLAN

GROUND WATER SAMPLING AND ANALYSIS PLAN
AND
GROUND WATER ASSESSMENT PLAN OUTLINE

EATON CORPORATION

STANDARD POWER CONTROL DIVISION

BOWLING GREEN, KENTUCKY

May, 1982
D&M Job #12461-004-21

INTRODUCTION

This document presents the Ground Water Sampling and Analysis Plan and the Ground Water Assessment Plan Outline required by U.S. EPA and Kentucky regulations governing hazardous waste management facilities.

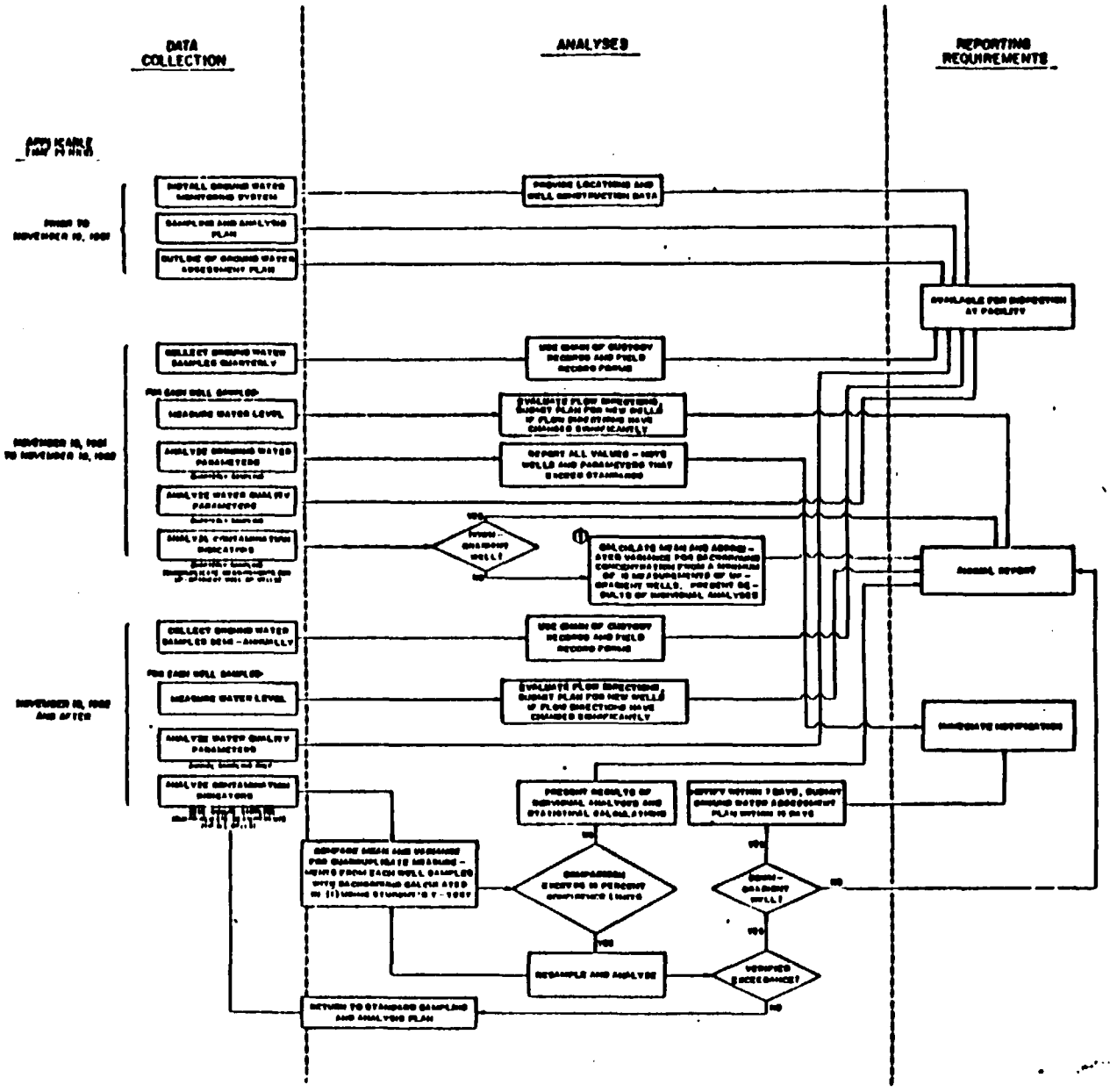
These two plans were developed in accordance with the regulations where the latter were specific. In those cases where guidelines were suggested, the following references were used:

1. "Procedures Manual for Ground Water Monitoring at Solid Waste Disposal Facilities, U.S. EPA, August, 1977 (reprinted December, 1980), EPA-530/SW-611.
2. "Methods for Chemical Analysis of Water and Wastes," U.S. EPA, March, 1979, EPA-600-4-79-020.
3. "Standard Methods for Analysis of Waters and Wastewater," 15th Edition, 1980.
4. "The Analysis of Organohalides (OX) in Water as a Group Parameter," R.C. Dressman, B.A. Najar, and R. Redzikowski, U.S. EPA, Drinking Water Research Division, Cincinnati, OH, 1979.

In addition, a section entitled "Record Keeping and Reporting Requirements" is enclosed which in flow chart and narrative form, indicates all necessary actions and decisions associated with ground water monitoring programs conducted to comply with the regulations.

RECORD KEEPING AND REPORTING REQUIREMENTS

A flow chart indicating all necessary actions and decisions associated with ground water monitoring programs designed to comply with U.S. EPA and Kentucky hazardous waste regulations is shown in Figure 1. The chart



SUMMARY OF RCRA GROUND WATER MONITORING AND REPORTING REQUIREMENTS

indicates procedures for the first and subsequent years of monitoring. All necessary information is on the chart - a brief description of important points is presented below:

- Only the drinking water standard parameters need be reported each quarter during the first year, with those values in excess of the standards noted.
- When the fourth quarterly sample has been taken and the results received, a single value of the mean and its associated variance is calculated for each of the contamination indicators on the basis of all measurements during the first year from up-gradient wells. This mean and variance is then considered the background concentration value for the entire facility against which all later statistical comparisons are to be made. The comparison of contamination indicators for a given well with "its initial background" makes use of the background as just defined.
- Statistical comparisons of values for contamination indicators in the wells in the monitoring system are not required at the end of the fourth quarterly sampling period. The first such comparison is made at the fifth sampling event; i.e., the first of the semi-annual sampling periods.
- After the first year, ground water contamination indicators are measured for each well semi-annually with four replicate measurements made for each sample. Statistical comparisons are required each time these samples are taken. A summary of sampling requirements is presented in Table 1.

TABLE 1

STANDARD SAMPLING PROGRAM

	Apr. 1982	June 1982	Aug. 1982	Oct. 1982	Feb. (1982-Closure)	Aug. (1983-Closure)
Ground Water Contamination Indicators	(X)	(X)	(X)	(X)	[X]	[X]
Drinking Water Parameters	X	X	X	X		
Ground Water Quality Parameters, Cyanide (total) and Nickel	X	X	X	X		X

(X) Quadruplicate samples from up-gradient wells
[X] Quadruplicate samples from all wells

- Each of the contamination indicators for each well in the monitoring system (both up- and down-gradient), on the basis of the mean and variance calculated from the four replicates taken at each independent, semi-annual sampling period, is compared with the initial background as defined above. When comparison of a down-gradient well with background utilizing the t-test shows a significant increase (or pH decrease) in any of the contamination indicators, this triggers a program of resampling the affected wells; if the difference is verified, the regulatory authority must be notified and a specific ground water assessment plan must be developed and implemented.
- In addition to presentation of data collected and statistical calculations, annual reporting requirements include notification of significant changes in up-gradient well water quality and changes

in ground water elevations which change the status of a well being up-gradient or down-gradient.

SAMPLING AND ANALYSIS PLAN

As required, this written plan for ground water monitoring contains procedures for:

1. Sample collection.
2. Sample preservation and shipment.
3. Analytical procedures.
4. Chain of custody control.

Information regarding the wells included in the monitoring system is detailed in Daugherty, Trautwein, and Harris, Inc. report entitled "Hazardous Sub-Surface Investigation" and their locations are plotted on the accompanying map. Well No. 4 is the up-gradient well and Well Nos. 8, 9, and 10 are the down-gradient wells to be used for monitoring ground water quality beneath the hazardous waste management facilities contained within the Eaton plant near Bowling Green, Kentucky.

SAMPLE COLLECTION

A. Equipment

The following equipment or equivalent will be used for sampling:

- o pH Meter - LaMotte Model HA
- o Conductivity Meter - YSI Model 33
- o Peristaltic Pump - Masterflex Model 7573-60
- o 10 mm diameter Tygon tubing
- o Water Level Indicator - M-Scope or Steel Tape

B. Measurements Prior to Sampling

- o Use Chain of Custody and Analysis Record forms provided.

- o Fill in owner's name and address and name and address of firm responsible for sampling.
- o Note well location, date, and time of sampling.
- o Measure water level in the well with steel tape marked with chalk or electric tape.
- o Record ground water elevation to the nearest 0.05 ft.
- o Record weather conditions.

C. Sampling

- o Remove 1 to 10 casing volumes with a centrifugal, air lift, or peristaltic pump or a polyvinyl chloride (PVC) bailer.
- o Record approximate number of casing volumes removed.
- o After sufficient recovery in the well, collect approximately 7 liters of sample with peristaltic pump or bailer and specify type of equipment used. No filtering of sample is to be done.
- o Fill each bottle to top without overflowing. Preservatives have been pre-measured in the amounts and types shown on the Sampling, Chain of Custody, and Analysis Record and placed in bottle by laboratory prior to delivery to the field.
- o Specify parameters for analysis on Sampling, Chain of Custody, and Analysis Record. During the first year all parameters are to be analyzed.
- o Write well identification number, job number, and date on each sample bottle with pencil or ball point pen.
- o Make field measurements--pH, conductivity, and temperature--of sample in a clean container or bailer. Make quadruplicate

SAMPLING, CHAIN OF CUSTODY AND ANALYSIS RECORD
FOR RCRA GROUND WATER MONITORING PROGRAMS

Owner _____ Firm Responsible for Sampling _____

Address _____ Address _____

_____ _____

Attn: _____ Attn: _____

Job No. _____

Field Measurements

Well Identification _____ Temperature _____ Sampling Equipment _____

Casing Volumes Removed _____

Date of Sampling _____ pH _____

Time _____

Depth to Water _____ Conductance _____

Datum and Elevation _____ Comments _____

Ground Water Elevation _____ _____

Weather Conditions _____

Sample Preservation and Analyses

Check Samples Shipped	Ref. No.	Container	Preservative	Parameters for Analysis
_____	1	500 ml plastic	2.5 ml HNO_3 (Total Recoverable)	As, Ba, Cd, Cr, Pb, Hg, Ag, Se, Fe, Mn, Na
_____	2	1 liter plastic	Cool 4° C	F, Cl, SO_4, pH, SC
_____	3	250 ml plastic	0.25 ml H_2SO_4	NO_3, TOC
_____	4	1 liter glass	1 ml H_3PO_4, 1 g $CuSO_4$	Phenols
_____	5	1 liter glass	Cool, 4° C	Pesticides*, Herbicides**
_____	6	250 ml glass	Cool, 4° C, Sodium Thiosulfate	Coliform
_____	7	1 liter glass	1 ml HNO_3	Gross alpha, gross beta, radium-226, 228
_____	8	250 ml plastic	6.25 mg $NaSO_3$	TOX

(Circle parameters for analysis)

Shipping Information

Shipped or delivered to lab by _____

Date _____ Time _____

I hereby certify that to the best of my knowledge ground water samples listed above were obtained in accordance with _____'s (OWNER) filed sampling and analysis plan and are safely containerized and labeled for delivery to the laboratory.

Signature _____

RECEIVING LABORATORY _____

Address _____

Attn. _____

QUADRUPLICATE TESTS REQUIRED FOR:

☐ TOC, TOX, pH, SC

_____ All samples received intact.

_____ List samples missing or damaged.

Date Received _____ Time _____

Accepted by _____

Distribution:

White - w/shipment to laboratory
Canary - to Dames & Moore P.M.
Pink - to Owner
Goldenrod - retained by field engineer

* Pesticides = Endrin, Lindane, Methoxychlor, Toxaphene

** Herbicides = 2,4-D and 2,4,5-TP Silvex
Bottle to be capped with aluminum foil or teflon

measurements as required. Calibrate equipment with standards at least once at each facility.

SAMPLE PRESERVATION AND SHIPMENT

Site Near Laboratory

All bottles are to be placed in coolers at 4° Centigrade and delivered to the McCoy and McCoy, Madisonville laboratory by the person who collects samples in the field. Preservatives will have been added to sample bottles prior to delivery to the field in the amounts noted on the Sampling, Chain of Custody, and Analysis Record. The person delivering the samples will fill in the information required under shipping information on the record.

Site Remote from Laboratory

Should it become necessary to use a laboratory other than the McCoy and McCoy facility at Madisonville, all bottles are to be placed in coolers at 4° C. Preservatives will have been added to sample bottles prior to delivery to the field in the amounts noted on the Sampling, Chain of Custody, and Analysis Record. The person who has collected samples will deliver them to the closest bus depot for shipment to the laboratory and fill in the required items under shipping information including the name of the carrier and the shipping invoice number.

ANALYTICAL PROCEDURES

A summary of the three groups of parameters to be measured--drinking water standards, ground water quality parameters, and ground water contamination indicators--is shown in Table 2. Also listed are the analytical methods and corresponding detection limits. Additionally, due to the materials used in the waste treatment facility, cyanide (total) and nickel

TABLE 2

SUMMARY OF GROUND WATER MONITORING PARAMETERS AND ANALYTICAL METHODS

Drinking Water Standards Parameters

Parameter	Maximum Allowable Concentration (mg/l)	Detection Limit	Method	EPA (1979) Method Number
Arsenic*	0.05	0.001 mg/l	Digestion followed by atomic absorption, furnace	206.2
Barium*	1.0	0.1 mg/l	Digestion followed by atomic absorption	208.1
Cadmium*	0.01	0.0001 mg/l	Digestion followed by atomic absorption, furnace	213.2
Chromium	0.05	0.001 mg/l	Digestion followed by atomic absorption, furnace	218.2
Fluoride	1.4 - 2.4	0.1 mg/l	Distillation followed by ion electrode; SPADNS	340.1
Lead*	0.05	0.001 mg/l	Digestion followed by atomic absorption, furnace	239.2
Mercury*	0.002	0.0002 mg/l	Flameless atomic absorption	245.1
Nitrate (as NO_3-N)	10.0	0.01 mg/l	Cadmium reduction	353.3
Selenium*	0.01	0.002 mg/l	Digestion followed by atomic absorption, furnace	270.2
Silver*	0.05	0.0002 mg/l	Digestion followed by atomic absorption, furnace	272.2
Endrin	0.0002	0.0001 mg/l	Extraction, gas chromatography	509^
Lindane	0.004	0.001 mg/l	Extraction, gas chromatography	509^
Methoxychlor	0.1	0.001 mg/l	Extraction, gas chromatography	509^
Toxaphene	0.005	0.001 mg/l	Extraction, gas chromatography	
2, 4-D	0.1	0.001 mg/l	Extraction, gas chromatography	504^
2, 4, 5-TP Silvex	0.01	0.001 mg/l	Extraction, gas chromatography	504^
Gross Alpha	15.0 pCi/l	3.0 pCi/l	Scintillation count	703^
Gross Beta	4.0 millirem/yr	0.1 pCi/l	Scintillation count	703^
Radium 226	15.0 pCi/l	0.05 pCi/l	Scintillation count	706^
Radium 228		0.05 pCi/l	Scintillation count	707^
Coliform Bacteria	1/100 ml	2.2 MPN/100 ml	Multiple tube fermentation	908^

Ground Water Quality Parameters

Chloride	NA	1.0 mg/l	Automated colorimetric	325.1
Iron*	NA	0.03 mg/l	Digestion followed by atomic absorption	236.1
Manganese*	NA	0.01 mg/l	Digestion followed by atomic absorption	243.1
Phenols	NA	0.002 mg/l	Colorimetric, (4-AAP)	420.2
Sodium*	NA	0.002 mg/l	Digestion followed by atomic absorption	273.1
Sulfate	NA	3.0 mg/l	Colorimetric	375.2

Ground Water Contamination Indicators

pH	NA	±0.1 units	Electrometric measurement	150.1
Specific Conductance	NA	±6 µmhos/cm	Wheatstone bridge	120.1
Total Organic Carbon	NA	1 mg/l	Combustion - with flame ionization	415.1
Total Organic Halogen	NA	1 mg/l	Dohrmann micro-coulometric detector, carbon absorption	^^

NA = Not applicable

^ = Number is reference from Standard Methods for Examination of Waters and Wastewater, 18th Edition (1992)

^^ = "The Analysis of [illegible]

will also be measured as ground water quality parameters. This is for purposes of providing background data which may be useful should an assessment program be necessary after the first semi-annual sampling subsequent to the one year of initial monitoring.

CHAIN OF CUSTODY CONTROL

Site Near Laboratory

Samples will be delivered directly to the laboratory by the person obtaining them in the field. The person responsible for field sampling will fill in the required information under shipping information on the Sampling, Chain of Custody, and Analysis record, and witness written acceptance by the receiving laboratory. One copy of the Record will be retained by the labortory and returned along with the results of the analyses.

Site Remote From Laboratory

If a laboratory other than McCoy & McCoy, Madisonville is to analyze the samples, each cooler will be sealed with tape prior to shipping samples to laboratory by bus. Sampling, Chain of Custody, and Analysis forms for samples contained in each cooler will be placed in plastic envelopes and sealed under the tape. In addition, senders will sign their names on the tape at the seam. The sender will notify the laboratory of shipment and expected arrival time.

Upon receipt at the laboratory, data and time of arrival will be noted on the Sampling, Chain of Custody, and Analysis forms. Receiver will verify that the tape seal is intact and make note of sample bottle condition on the form. The form will be retained by the laboratory and returned with the results of the analyses.

GROUND WATER ASSESSMENT PLAN OUTLINE

In accordance with the regulations, when comparison of down-gradient well ground water contamination indicators with background ground water contamination indicators exceeds the 99 percent confidence limits using Student's "t" comparison, the following steps will be taken:

A. o The well or wells which exceed the 99 percent confidence limits would be re-sampled in duplicate and the samples preserved, shipped, and analyzed for ground water contamination indicators in accordance with the Sampling and Analysis Plan.

o If comparison of the ground water contamination indicators from the second set of samples with the background values verifies that the 99 percent confidence limits are exceeded, written notification to the Kentucky Department of Natural Resources and Environmental Protection will be provided within seven days to the effect that the facility may be affecting ground water quality.

B. o Within 15 days after notification, a specific plan would be presented to the Department which would include the following:

a A review of all ground water quality and hazardous waste test data collected for the facility.

b An identification of specific parameters that may be causing contamination on the basis of the review.

c Waste type(s) and locations likely to have caused contamination on the basis of the review above (b) (This information would be shown on a map with ground water elevations).

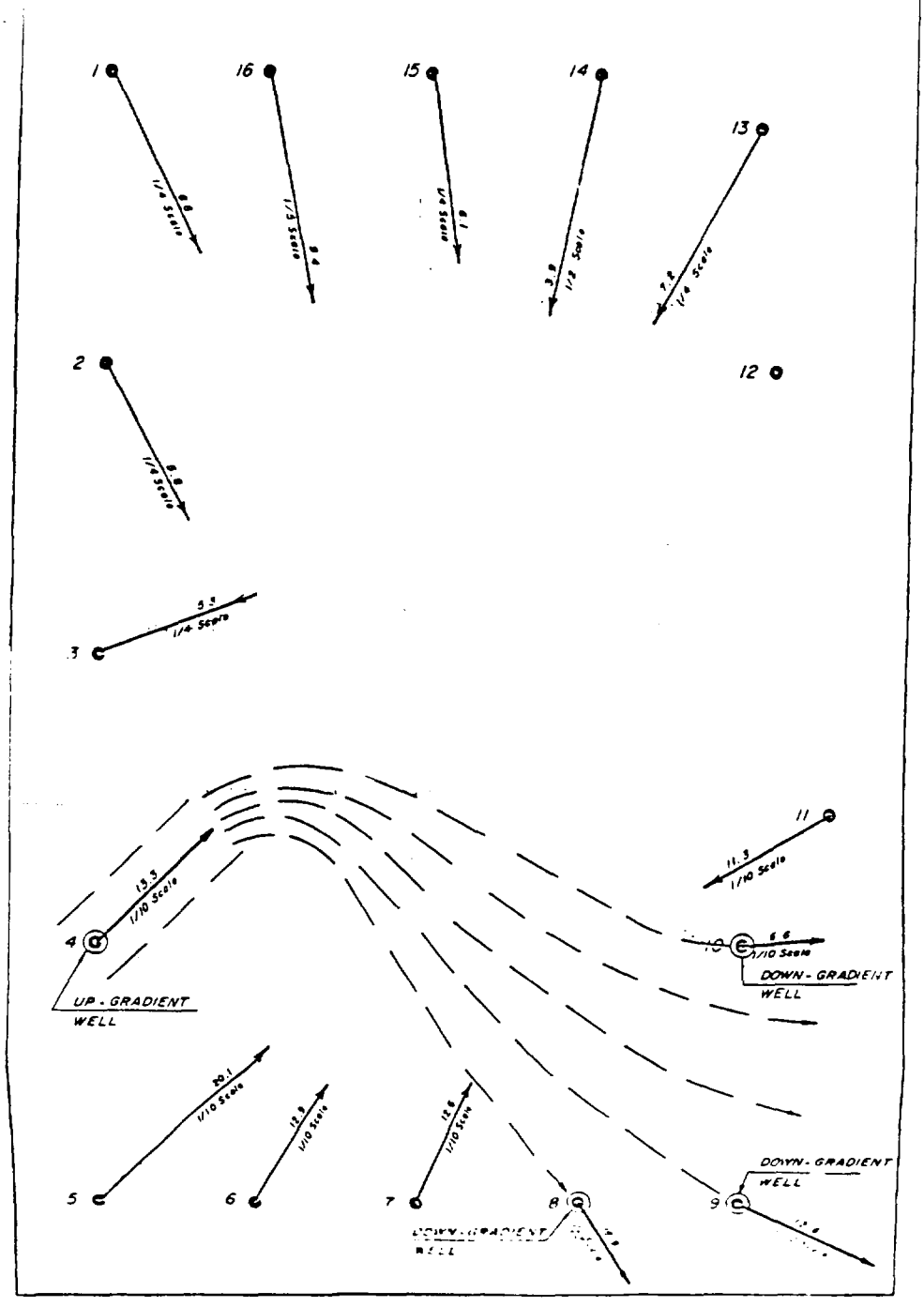
d A program developed by a certified geologist or geotechnical

engineer and a schedule for implementation to determine the concentrations, rate, and extent of hazardous waste or hazardous waste constituents in ground water. This program would be implemented in two stages:

i) Samples from the well or wells which indicate contamination would be obtained in general accordance with methods described in the Sampling and Analysis Plan. Analyses of parameters selected on the basis of specific waste constituents managed at the facility would be performed. If it is determined that the concentration increases are not related to the facility, normal monitoring would be re-instituted. If it is determined that hazardous waste has entered the ground water and sufficient data is available to charactrize the rate and extent of contaminant movement, then:

ii) Additional monitoring wells would be installed, ground water elevations established, and samples obtained and analyzed for specific waste constituents. Additional steps that may be necessary to estimate rate of movement might include laboratory experiments to determine geochemical interactions between wastes and natural soils, additional field testing to determing ground water velocity, and mathematical modeling.

NOTE : Units shown depict ∇h Differential of Piezometric Well Measurements



SUB-STRATA VECTOR ANALYSIS

SCALE 1" = 0. ∇h

OCT 66

APPENDIX B
RCRA GROUND WATER MONITORING SEMI-ANNUAL REPORT

RCRA GROUND WATER MONITORING
SEMI-ANNUAL REPORT
EATON CORPORATION
BOWLING GREEN, KENTUCKY

JOB NO. 12461-006-21
APRIL 3, 1984

Dames & Moore

Dames & Moore
644 Linn Street
Suite 501
Cincinnati, Ohio 45203
(513) 651-3440

April 4, 1984

Mr. M.H. Smith
Senior Project Engineer
Eaton Corporation
P.O. Box 1158
Bowling Green, Kentucky 42101

Dear Mr. Smith:

Re: Third Year Ground Water
Monitoring Program

In this letter we are transmitting the results and analyses of the first semi-annual sampling of 1984 of the monitoring wells numbered 4, 8, 9, and 10 at Eaton Corporation's Bowling Green facility. This sampling was in accordance with the sample and analysis plan prepared by Dames & Moore for the facility.

Sampling and Analysis Results

Sampling was conducted for all the wells on 1 March 1984. Ground water level measurements were made at the time of the sampling and are presented in Table 1. The ground water flow was opposite that of previous sampling trips, with Well #4 having the lowest water level.

According to regulations for interim status hazardous waste facilities, 40 CFR 265.92, samples were analyzed for the indicator parameters pH and specific conductance in the field and for total organic carbon (TOC) and total organic halogens (TOX) in the laboratory. All indicator parameters were analyzed in quadruplicate. The water quality parameters chloride, iron, manganese, phenols, sodium, and sulfate were also analyzed. Nickel and cyanide were also analyzed specifically for Eaton. Results are presented in Table 1. Most of the concentrations were less than those found during the 1982 sampling. TOXs were again not found at the detection limit of 1 ug/l.

Statistical analyses were performed on three indicator parameters (pH, specific conductance, total organic carbon) by the Student t-test procedure recommended by the Kentucky Division of Waste Management. (The fourth indicator parameter, total organic halogen, was not detectable at any of the four wells.) This test compares the results of the second biannual sampling against the background data collected at the upradient well (#4) in 1982. Results of these statistical tests are presented in Table 2. They show that pH readings in wells #8, #9, and #10 were statistically different.

The laboratory results and our field logs are attached to this letter for your information.

Conclusions and Recommendations

It is Dames & Moore's judgment that the significant changes in pH in well #'s 8, 9, and 10 are likely to be a result of natural changes in ground water as recharge occurs during this time of year. Average pH values were still close to neutrality. According to 401 KAR 35:060 Section 4. (3)(b), Eaton could confirm these significant pH differences by resampling. However, it is our opinion that these differences probably are real and that resampling would confirm this. The next step [Section (4)(a)] is to report these results immediately to the Division of Waste Management. Since the significant differences were for pH only and there is no evidence of any inorganic contaminants (Ni, Cn) due to leakage from the lagoon, we do not recommend any further investigation at the present time. These differences are most likely related to ambient changes in ground water quality, and resampling to confirm statistically significant pH differences is unnecessary.

Another issue is the apparent direction of ground water movement at the time of the March sampling. Ground water levels revealed that well #4, previously the upgradient well, had the lowest water level. According to Section 4.(b) Eaton must immediately modify the well monitoring system to conform to Section 2.(1), which states that there must be one upgradient and three downgradient wells.

Due to the variability of the ground water flow direction, it is our recommendation that, subject to approval by the Division of Waste Management, water levels be obtained to determine flow directions prior to the second semi-annual sampling program. If the flow has returned to the previously existing conditions with northward flow, the present monitoring configuration be maintained. If, however, the flow regime which exists at the time of this samping is maintained, we recommend that monitoring wells 3, 4, and 5 be used as downgradient wells and well 10 be employed as the upgradient observation point.

Sincerely,

DAMES & MOORE

Steve Lamb
Staff Hydrologist

Stuart Edwards
Associate

SL/SE/ds

TABLE 1

CHEMICAL ANALYSES AND GROUND WATER ELEVATIONS
FIRST SEMI-ANNUAL SAMPLING
THIRD YEAR MONITORING PROGRAM

Well No.	Depth to Water (ft)	Ground Water Elevation (ft MSL)	TOC (mg/l)	pH units	Specific Conductance umhos/cm	TOX (ug/l)
4	17.17	521.55	27.9	6.5	288	<1.0
			27.8	6.8	295	"
			27.9	6.9	294	"
			27.8	6.9	294	"
8	10.83	527.75	14.3	6.6	193	<1.0
			14.3	6.8	190	"
			14.7	6.9	191	"
			14.6	6.9	191	"
9	16.26	522.65	27.1	6.5	264	<1.0
			27.0	6.7	267	"
			26.9	6.8	266	"
			26.9	6.8	268	"
10	15.51	523.87	22.7	6.4	238	<1.0
			23.1	6.6	239	"
			22.9	6.7	237	"
			23.0	6.9	236	"

Well	Nickel	Cyanide	Chloride	Iron	Manganese	Phenol	Sodium	Sulfate
4	<0.06	<0.02	17	0.15	<0.02	<0.04	6.71	32
8	<0.06	<0.02	8	0.38	<0.02	<0.04	3.28	35
9	<0.06	<0.02	10	0.25	<0.02	<0.04	2.54	35
10	<0.06	<0.02	14	0.14	<0.02	<0.04	4.68	26

TABLE 2

STATISTICAL ANALYSES
FIRST SEMI-ANNUAL SAMPLING
THIRD YEAR MONITORING PROGRAM

Well Number	Parameter	X_m	S_m^2	W_m	t_c	t^*	Significant Difference
4	TOC	27.85	0.0033	0.0008	2.60	-1.87	NO
	pH	6.78	0.0358	0.0090	5.16	-3.73	NO
	Sp. Cond.	292.8	10.25	2.5625	2.60	-5.60	NO
8	TOC	14.48	0.0425	0.0106	2.60	-4.65	NO
	pH	6.80	0.0200	0.0050	4.81	-5.32	YES
	Sp. Cond.	191.3	1.58	0.3950	2.61	-12.13	NO
9	TOC	26.98	0.0092	0.0023	2.60	-2.05	NO
	pH	6.70	0.0200	0.0050	4.81	-6.45	YES
	Sp. Cond.	266.3	2.92	0.7300	2.61	-7.32	NO
10	TOC	22.93	0.0019	0.0005	2.60	-2.89	NO
	pH	6.65	0.0433	0.0108	5.25	-5.32	YES
	Sp. Cond.	237.5	1.67	0.4175	2.61	-9.17	NO

SAMPLING, CHAIN OF CUSTODY AND ANALYSIS REQUEST FORM
FOR RCRA GROUND WATER MONITORING PROGRAMS

Owner: Eaton
Address: Bowling Green
Attn: Mel Smith

Firm Responsible for Sampling: Dames + Moore
Address: Lexington
Attn:
Job No.: 12461-006

Field Measurements

Well Identification: #4
Date of Sampling: 3/1/84
Time: 1250 CST
Depth to Water: 17.17'
Datum and Elevation:
Ground Water Elevation:
Weather Conditions:

Temperature: 13.2
Sampling Equipment: 5 g.
Casing Volumes Removed:
pH: 6.5 · 6.8 · 6.9 · 6.9
Conductance: 288 · 295 · 294 · 294
Comments:

Sample Preservation and Analyses

Check Samples Shipped	Ref. No.	Container	Preservative	Parameters for analysis
	1	500 ml plastic	2.5 ml HNO_3 (Total Recoverable)	As, Ba, Cd, Cr, Pb, Hg, Ag, Se, Fe, [illegible]
✓	2	1 liter plastic	Cool 4° C	F, Cl, SO_4, pH, SC
	3	250 ml plastic	0.25 ml H_2SO_4	NO_3, (TOC)
✓	4	1 liter glass	1 ml H_3PO_4, 1 g $CuSO_4$	Phenols
	5	1 liter glass	Cool, 4° C	Pesticides[a], Herbicides[aa]
	6	250 ml glass	Cool, 4° C, Sodium Thiosulfate	Coliform
	7	1 liter glass	1 ml HNO_3	Gross alpha, gross beta, radium-226, [illegible]
	8	250 ml plastic	6.25 mg $NaSO_3$	(TOX)

(Circle parameters for analysis)

Shipping Information

Shipped or delivered to lab by: Greyhound
Date: 3/1/84 Time:

I hereby certify that to the best of my knowledge ground water samples listed above were obtained in accor[illegible]
with Eaton's (OWNER) filed sampling and analysis plan an[illegible]
safely containerized and labeled for delivery to the laboratory.

Signature:

RECEIVING LABORATORY: McCoy + McCoy
Address: Madisonville
Attn.: Doug Wolfe

QUADRUPLICATE TESTS REQUIRED FO[illegible]
X (TOC, TOX) pH, SC

_____ All samples received intact.
_____ List samples missing or damaged.

Date Received: Time:

Accepted by:

Distribution:
White - w/shipment to laboratory
Canary - to Dames & Moore P.M.
Pink - to Owner
Goldenrod - retained by field engineer

[a] Pesticides - Endrin, Lindane, Methoxychlor, Toxa[illegible]
[aa] Herbicides - 2,4-D and 2,4,5-TP Silvex
· Bottle to be capped with aluminum foil or teflo[illegible]

SAMPLING, CHAIN OF CUSTODY AND ANALYSIS RECORD
FOR RCRA GROUND WATER MONITORING PROGRAMS

Owner: Eaton
Address: Bowling Green
Attn: Mel Smith

Firm Responsible for Sampling: Dames & Moore
Address: Lexington
Attn:
Job No. 12461-006

Field Measurements

Well Identification: #8
Date of Sampling: 3/1/84
Time: 1225 CST
Depth to Water: 10.83'
Datum and Elevation:
Ground Water Elevation:
Weather Conditions:

Temperature: 10.9
Sampling Equipment:
Casing Volumes Removed:
pH: 6.6; 6.8; 6.9; 6.9
Conductance: 193; 190; 191; 191
Comments:

Sample Preservation and Analyses

Check Samples Shipped	Ref. No.	Container	Preservative	Parameters for Analysis
	1	500 ml plastic	2.5 ml HNO_3 (Total Recoverable)	As, Ba, Cd, Cr, Pb, Hg, Ag, Se, Fe, F, Cl, SO_4, pH, SC
✓	2	1 liter plastic	Cool 4° C	NO_3, TOC
	3	250 ml plastic	0.25 ml H_2SO_4	Phenols
	4	1 liter glass	1 ml H_3PO_4, 1 g $CuSO_4$	Pesticides*, Herbicides**
✓	5	1 liter glass	Cool, 4° C	Coliform
	6	250 ml glass	Cool, 4° C, Sodium Thiosulfate	Gross alpha, gross beta, radium-226, TOX
	7	1 liter glass	1 ml HNO_3	(Circle parameters for analysis)
	8	250 ml plastic	6.25 mg $NaSO_3$	

Shipping Information

Shipped or delivered to lab by: Greyhound
Date: 3/1/84 Time:

I hereby certify that to the best of my knowledge ground water samples listed above were obtained in accordance with Eaton's (OWNER) filed sampling and analysis plan and safely containerized and labeled for delivery to the laboratory.

Signature:

RECEIVING LABORATORY: McCoy - McCoy
Address: Mediamville
Attn.: Doug Wolfe

QUADRUPLICATE TESTS REQUIRED FOR: TOC, TOX, pH, SC

_____ All samples received intact.
_____ List samples missing or damaged.
Date Received: Time:

Accepted by:

Distributions:
White - w/shipment to laboratory
Canary - to Dames & Moore P.M.
Pink - to Owner

* Pesticides - Endrin, Lindane, Methoxychlor, Toxaphene
** Herbicides - 2,4-D and 2,4,5-TP Silvex
Bottle to be capped with aluminum foil or teflon

SAMPLING, CHAIN OF CUSTODY AND ANALYSIS RECORD
FOR RCRA GROUND WATER MONITORING PROGRAMS

Owner: Eaton
Address: Bowling Green
Attn: Mel Smith

Firm Responsible for Sampling: Dames & Moore
Address: Lexington
Attn:
Job No. 12461-006

Field Measurements

Well Identification: #9
Date of Sampling: 3/1/84
Time: 1145 CST
Depth to Water: 16.26'
Datum and Elevation:
Ground Water Elevation:
Weather Conditions:

Temperature: 11.6
Sampling Equipment:
Casing Volumes Removed:
pH: 6.4; 6.7; 6.8; 6.8
Conductance: 264; 267; 266; 268
Comments:

Sample Preservation and Analyses

Check Samples Shipped	Ref. No.	Container	Preservative	Parameters for Analysis
✓	1	500 ml plastic	2.5 ml HNO_3 (Total Recoverable)	As, Ba, Cd, Cr, Pb, Hg, Ag, Se, Fe, Mn,
	2	1 liter plastic	Cool 4° C	F, Cl, SO_4, pH, SC
	3	250 ml plastic	0.25 ml H_2SO_4	NO_3, TOC
	4	1 liter glass	1 ml H_3PO_4, 1 g $CuSO_4$	Phenols
✓	5	1 liter glass	Cool, 4° C	Pesticides*, Herbicides**
	6	250 ml glass	Cool, 4° C, Sodium Thiosulfate	Coliform
	7	1 liter glass	1 ml HNO_3	Gross alpha, gross beta, radium-226, 228
	8	250 ml plastic	6.25 mg $NaSO_3$	TOX

(Circle parameters for analysis)

Shipping Information

Shipped or delivered to lab by: Greyhound
Date: 3/1/84 Time:

I hereby certify that to the best of my knowledge ground water samples listed above were obtained in accordan with Eaton's (OWNER) filed sampling and analysis plan and s safely containerized and labeled for delivery to the laboratory.

Signature: JW

RECEIVING LABORATORY: McCoy + McCoy
Address: Madisonville
Attn.: Ray Wolfe

QUADRUPLICATE TESTS REQUIRED FOR:
[X] TOC, TOX, pH, SC

_____ All samples received intact.
_____ List samples missing or damaged.

Date Received: Time:

Accepted by:

Distributions:
White - w/shipment to laboratory
Canary - to Dames & Moore P.M.
Pink - to Owner
Goldenrod - retained by field engineer

* Pesticides - Endrin, Lindane, Methoxychlor, Toxaphene
** Herbicides - 2,4-D and 2,4,5-TP Silvex
Bottle to be capped with aluminum foil or teflon

SAMPLING, CHAIN OF CUSTODY AND ANALYSIS PLANS
FOR RCRA GROUND WATER MONITORING PROGRAMS

Owner: Eaton
Address: Bowling Green
Attn: Mel Smith

Firm Responsible for Sampling: Dames & Moore
Address: Lexington
Attn:
Job No.: 12461-006

Field Measurements

Well Identification: #10
Date of Sampling: 3/1/84
Time: 1045 CST
Depth to Water: 15.51'
Datum and Elevation:
Ground Water Elevation:
Weather Conditions: Inside dome

Temperature: 12.4
Sampling Equipment: 5 gal
Casing Volumes Removed:
pH: 6.9; 6.6; 6.7; 6.8
Conductance: 238; 239; 237; 236
Comments:
Outside is sunny 5°C

Sample Preservation and Analyses

Check Samples Shipped	Ref. No.	Container	Preservative	Parameters for Analysis
	1	500 ml plastic	2.5 ml HNO_3 (Total Recoverable)	As, Ba, Cd, Cr, Pb, Hg, Ag, Se, Fe, [illegible]
✓	2	1 liter plastic	Cool 4° C	F, Cl, SO_4, pH, SC
	3	250 ml plastic	0.25 ml H_2SO_4	NO_3, TOC
	4	1 liter glass	1 ml H_3PO_4, 1 g $CuSO_4$	Phenols
✓	5	1 liter glass	Cool, 4° C	Pesticides*, Herbicides**
	6	250 ml glass	Cool, 4° C, Sodium Thiosulfate	Coliform
	7	1 liter glass	1 ml HNO_3	Gross alpha, gross beta, radium-226, 228
	8	250 ml plastic	6.25 mg $NaSO_3$	TOX

(Circle parameters for analysis)

Shipping Information

Shipped or delivered to lab by: Greyhound
Date: 3/1/84 Time:

I hereby certify that to the best of my knowledge ground water samples listed above were obtained in accordan
with Eaton's (OWNER) filed sampling and analysis plan and a
safely containerized and labeled for delivery to the laboratory.

Signature: TW

RECEIVING LABORATORY: McCoy + McCoy
Address: Madisonville
Attn.: Doug Wolfe

QUADRUPLICATE TESTS REQUIRED FOR:
ID: TOC, TOX pH, SC

_____ All samples received intact.
_____ List samples missing or damaged.

Date Received: Time:

Accepted by:

Distributions:
White - w/shipment to laboratory
Canary - to Dames & Moore P.M.
Pink - to Owner
Goldenrod - retained by field engineer

* Pesticides - Endrin, Lindane, Methoxychlor, Toxaphene
** Herbicides - 2,4-D and 2,4,5-TP Silvex
Bottle to be capped with aluminum foil or teflon

McCOY & McCOY, Inc.
Environmental Consultants

P.O. BOX 238 MADISONVILLE, KENTUCKY 42431
P.O. BOX 1411 PADUCAH, KENTUCKY 42001
P.O. BOX 208 PIKEVILLE, KENTUCKY 41501

REPORT DATE. 3/21/84

Dames & Moore Inc.
Attn: Tom Van Arsdale
2551 Regency Rd., Suite 105
Lexington, KY 40503

	LOCATION NO.	SAMPLE DATE
1.	#4	3/1/84
2.	#8	3/1/84
3.	#9	3/1/84
4.	#10	3/1/84
5.		

ton Corp. Samples

REPORT OF CHEMICAL ANALYSIS

TEST DESCRIPTION		1	2	3	4
TAL ORGANIC CARBON	PPM	27.9	14.3	27.1	22.7
		27.8	14.3	27.0	23.1
		27.9	14.7	26.9	22.9
		27.8	14.6	26.9	23.0
TAL ORGANIC HALOGENS	PPB	<1.0	<1.0	<1.0	<1.0
		<1.0	<1.0	<1.0	<1.0
		<1.0	<1.0	<1.0	<1.0
		<1.0	<1.0	<1.0	<1.0
LORIDE	PPM	17.0	8.0	10.0	14.0
)N	PPM	0.15	0.38	0.25	0.14
IGANESE	PPM	<0.02	<0.02	<0.02	<0.02

Remarks:

1. All analysis performed as per 14th Edition Standard Methods for Water and Wastewater Analysis unless otherwise noted.
2. Laboratory and personnel certified by Commonwealth of Kentucky - Department for Human Resources - Bureau for Health Services for bacteriological analysis.
3. 1 PPM-1 mg/l

By Doug Wolfe
For McCoy & McCoy, Inc.

McCOY & McCOY, Inc.
Environmental Consultants

P.O. BOX 238 MADISONVILLE, KENTUCKY 42431
P.O. BOX 1411 PADUCAH, KENTUCKY 42001
P.O. BOX 208 PIKEVILLE, KENTUCKY 41501

REPORT DATE. 3/21/84

PAGE NO.

Dames & Moore Inc.
Attn: Tom Van Arsdale
2551 Regency Rd., Suite 105
Lexington, KY 40503

	LOCATION NO.	SAMPLE DATE
1.	#4	3/1/84
2.	#8	3/1/84
3.	#9	3/1/84
4.	#10	3/1/84
5.		

n Corp Samples

REPORT OF CHEMICAL ANALYSIS

TEST DESCRIPTION		1	2	3	4
OLS	PPM	<0.04	<0.04	<0.04	<0.04
UM	PPM	6.71	3.28	2.54	4.68
ATE	PPM	32.0	35.0	35.0	26.0

marks:

1. All analysis performed as per 14th Edition Standard Methods for Water and Wastewater Analysis unless otherwise noted.
2. Laboratory and personnel certified by Commonwealth of Kentucky - Department for Human Resources - Bureau for Health Services for bacteriological analysis.
3. 1 PPM-1 mg/l

By Don Wolfe
For McCoy & McCoy, Inc.

McCOY & McCOY, Inc.
Environmental Consultants

P.O. BOX 238 MADISONVILLE, KENTUCKY 42431
P.O. BOX 1411 PADUCAH, KENTUCKY 42001
P.O. BOX 208 PIKEVILLE, KENTUCKY 41501

REPORT DATE. 3/21/84

Dames & Moore Inc.
Attn: Tom Van Arsdale
2551 Regency Rd., Suite 105
Lexington, KY 40503

	LOCATION NO.	SAMPLE DATE
1.	#4	3/1/84
2.	#8	3/1/84
3.	#9	3/1/84
4.	#10	3/1/84
5.		

on Corp Samples

REPORT OF CHEMICAL ANALYSIS

TEST DESCRIPTION		1	2	3	4
KEL	PPM	<0.06	<0.06	<0.06	<0.06
NIDE	PPM	<0.02	<0.02	<0.02	<0.02

emarks:

1. All analysis performed as per 14th Edition Standard Methods for Water and Wastewater Analysis unless otherwise noted.
2. Laboratory and personnel certified by Commonwealth of Kentucky - Department for Human Resources - Bureau for Health Services for bacteriological analysis.
3. 1 PPM-1 mg/l

By Doug Wolfe
For McCoy & McCoy, Inc.

APPENDIX C
LABORATORY ANALYSES

Resource Recycling Technologies, Inc.

and Divisions
Tennessee Oil and Refining, Inc.
Industrial Liquids Recycling, Inc.
Chem-Fuel, Inc.
2003 Gallatin Road: Madison, Tennessee 37115

May 11, 1981

PURPOSE OF ANALYSIS: At the request of Mr. Mel Smith of Easton-Cutler Hammer, Bowling Green, KY, the metal sludge beds located at the Plant Site and designated on the attached map were sampled. EP Toxicity determinations were made on composite, core samples from each bed. Total and free cyanide determinations were also made on each bed.

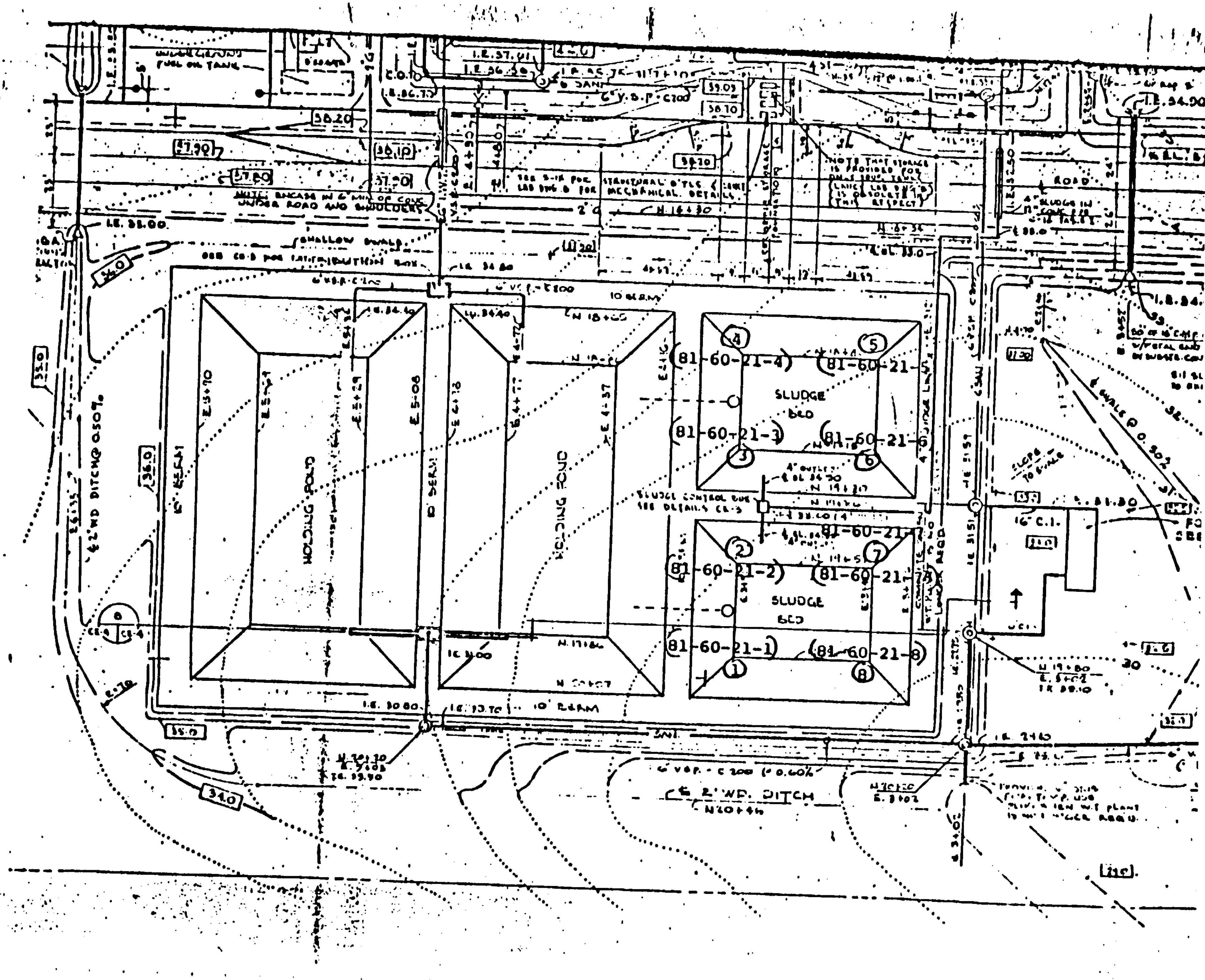
SAMPLING PROCEDURE: On Friday, May 1, 1981 at 4:00 PM, core samples were taken from two sludge beds located at Eaton, Cutter-Hammer, 2901 Fitzgerald Industrial Drive, Bowling Green, Kentucky. Sample locations are designated on the attached map.

All samples were taken with a "coliwassa-type" sampler. The sampler used is ten feet long and 1-1/4" inside diameter. The sampling was accomplished according to the "coliwassa" method 3.2.1 suggested in EPA SW-846 ("Test Methods for Evaluating Solid Waste - Physical/Chemical Methods"). The sampling coliwassa was lowered into the bed slowly with a twisting motion to assure even levels of waste inside and outside the sampler thus assuring a representative core sample. The samples were taken at each corner of the beds at a distance of approximately 10 feet from each bank. The sampler was lowered until the sludge layer on the bottom of the bed was penetrated. The total depth of the sample was 30" - 36". Duplicate samples were taken at each location and marked and combined. Each location yielded about 500 ml of sample. Additional samples, which were taken in the same manner, were taken at 6. and 7. These samples were placed in glass containers and used for the cyanide analysis.

JCC:bg

Enclosure

Previous Eaton analysis is listed in ACES proposal Appendix A.



SLUDGE BED
SLUDGE BED
HOLDING POND
HOLDING POND
(81-60-21-1)
(81-60-21-2)
(81-60-21-3)
(81-60-21-4)
(81-60-21-5)
(81-60-21-6)
(81-60-21-7)
(81-60-21-8)
10' BERM
SHALLOW SWALE
SLUDGE CONTROL BOX SEE DETAILS
ROAD
UNDERGROUND FUEL OIL TANK
℄ 2' WD. DITCH
2' WD DITCH @ 0.50%
16" C.I.

SAMPLE PREPARATION:

The samples were digested in nitric acid and followed by dilution with hydrochloric acid according to Method 4.1.3, "Method of Chemical Analysis of Waste Water." Method 4.1.4 was used for the silver analysis and the hydrochloric acid was omitted from the procedure.

ANALYSIS:

Total constituent analysis is as follows:

	Cr	Ag	Cu	Ni	Cd	Zn	Sn	Pb	Ba
Composite 1*	750	0.55	625	840	210	2500	150	37.5	110
Composite 2*	725	0.57	675	880	210	4750	140	37.5	135

*Values in ppm

JCC:bg

SAMPLE PREPARATION: Samples 81-60-21-1, 81-60-21-2, 81-60-21-7, and 81-60-21-8 were combined equally to form Composite 1. Samples 81-60-21-3, 81-60-21-4, 81-60-21-5, and 81-60-21-6 were combined equally to form Composite 2. Samples 81-60-21-6A and 81-60-21-7A were used for cyanide determinations.

Composite Samples 1 and 2 were subjected to the EP Toxicity Test Procedure as described in FR 45, (No. 98), May 19, 1980, Appendix II, p.33127, and in "Test Methods for the Evaluation of Solid Waste, Physical/Chemical Methods," SW-846.

ANALYSIS:

	Ba	Cr	Cd	As	Se	Pb	Hg	Ag
Composite 1*	7.0	0.45	3.2	0.025	<0.005	<0.5	0.0011	0.12
Composite 2*	9.0	0.45	7.5	0.040	<0.005	<0.5	<0.0002	0.10

*EP Toxicity Values all given in ppm

	Dissolved Cyanide	Total Cyanide
81-60-21-6A	10 ppm	61 ppm
81-60-21-7A	4 ppm	28 ppm

Composite 1 pH = 12.5
Composite 2 pH = 12.4

CONCLUSION: The sludge beds when subjected to EP Toxicity Determinations were found to yield high values for only cadmium (3.2 ppm and 7.5 ppm). The RCRA maximum allowable limit for cadmium is 1ppm. These sludge beds would, therefore, constitute a defined, hazardous waste. The high pH values(12.4 and 12.5) also put the beds at the limits for the definition of a corrosive. Furthermore, the levels of cyanide in the aqueous phase are quite high and would not be acceptable for discharge under most regulations. However, our preliminary studies indicate that the beds can be dewatered, and the water generated can be treated to yield an acceptable regulated effluent.

Respectfully submitted,

John C. Craig

John C. Craig, Ph. D.
Director of Technical Services

Parameter	Filtrate * (mg/l)	North Sludge (mg/Kg)	North Leachate (mg/l)	South Sludge (mg/Kg)	South Leach (mg/l)
pH	12.5	--	11.8	--	11.6
Cyanide	5.15	168	7.0	192	9.3
Chromium, Hex.	0.26	--	0.33	--	8.34
Chromium, Total	0.38	33.4	0.85	54.6	12.8
Copper	6.8	40.8	5.0	99.1	2.88
Cadmium	0.01	8.68	<0.01	15.5	<0.01
Lead	<0.01	1.17	<0.01	1.31	<0.01
Nickel	0.28	61.5	0.10	78.6	0.07
Zinc	2.67	284.	0.31	188.	1.09
Dry Solids (%)	--	34	--	32.8	--
Silver	0.02	1.40	<0.01	1.31	<0.01

* Equal volumes of filtrate from North and South beds mixed and analyzed.

Leach test was performed by adding 100 g sludge in 400ml deionized water and stirring for 48 hours. Analyses procedures used were those approved by the U. S. Environmental Protection Agency, as published, 40 CFR 136.3, or with modified procedures approved by EPA.

Parameter	Filtrate * (mg/l)	North Sludge (mg/Kg)	North Leachate (mg/l)	South Sludge (mg/Kg)	South Leacha (mg/l
pH	12.5	--	5.2	--	5.1
Cyanide, (Amen.)	1.18	--	--	--	--
Cyanide, (Tot.)	5.15	168.0	0.01	192.0	0.03
Chromium, (Hex.)	0.26	--	< .01	--	<0.01
Chromium, (Tot.)	0.38	33.4	< .01	54.6	0.03
Copper	6.8	40.8	3.08	99.1	10.1
Cadmium	0.01	8.68	8.48	15.5	13.8
Lead	<0.01	1.17	0.10	1.31	0.20
Nickel	0.28	61.5	15.4	78.6	17.1
Silver	0.02	1.40	0.07	1.31	0.14
Zinc	2.67	284.0	166.0	188.0	106.0
Total Solids	6122	--	3932	--	3276
%Dry Solids	--	34.0	--	32.8	--

*Equal volumes of filtrate from North and South Beds mixed and analysed.

Leach tests were preformed according to methods outlined by the Kentucky Department for Natural Resources and Environment Protection Cabinet

Dames & Moore

644 Linn Street
Suite 501
Cincinnati, Ohio 45203
(513) 651-3440

June 14, 1984

Mr. George Gilbert
Natural Resources and Environmental Protection Cabinet
Department for Environmental Protection
Division of Waste Management
Fort Boone Plaza
18 Reilly Road
Frankfort, KY 40601

Dear George:

Closure Plan Revision
Wastewater Settling Ponds and Sludge Beds
Eaton Corporation
Industrial Control Division
Bowling Green, Kentucky

In regards to a telephone conversation of June 14, 1984 between Mr. George Gilbert, Kentucky Division of Waste Management, and Mr. Steve Lamb of Dames & Moore regarding revisions to the Easton Wastewater Settling Pond and Sludge Beds closure plan, we are submitting this letter as the revisions to the closure plan.

The necessary revisions concern the handling of wastewater and the soil sampling program for closure certification.

1. All wash fluids collected from truck and equipment cleaning will be directed to the Eaton wastewater treatment facility.

2. Background soil samples will be obtained and analyzed for cadmium, hexavalent chromium, nickel, and cyanide (free) (40 CFR 261 Appendix VIII, F006). Six samples will be obtained for compositing. Each sample will be collected from a minimum depth of 12 inches to ensure collection (below the topsoil) and composited for analysis. Proposed collection points are indicated on Figure 1.

   At the completion of excavation of all the contained sludge, clay, and artificial liner in each impoundment area, CECOS Environmental shall grid each impoundment at 30-foot intervals resulting in four samples from within both the south and north sludge beds and eight from within the west and east settling ponds. Each sample will consist of 2-foot-deep plug samples, extracted, and isolation of samples at the surface and 6-inch intervals. All samples will be properly containerized and logged per chain-of-custody requirements for shipment to CECOS Environmental's subcontracted laboratory in Dayton, Ohio.

A. Surface samples: analysis of all samples for cadmium, chromium, nickel and free cyanide

B. Each 6-inch sample, as required: analysis of samples for the above parameters as determined by analysis of the surface samples

If the results indicate that mobile contaminants have penetrated below the impoundment bottom as determined by comparison with background soil quality, excavation will be conducted to ensure removal of contaminated soil. The backhoe and loader will be utilized to remove 6-inch "lifts" as required, excavating and loading approximately 26 truckloads per day. As such, each 6-inch lift can be removed in 1-1/2 working days.

Removal and disposal of all contaminated soil will be performed within 14 working days of stabilization and removal of the sludge.

3. All equipment used for excavating sludge and liner will be cleaned after removal of the sludge and following the removal of each 6-inch lift during removal of the clay liner and any further excavation of contaminated soil. As above, all wash fluid will be directed to the plant wastewater treatment facility.

4. Final certification will include:

   1. estimate of the amount of free liquid present in the surface impoundments prior to removal, date removed, and the treatment employed for disposal

   2. estimate of decontamination liquid, and accumulated precipitation during closure and their disposal methods (plant wastewater treatment facility)

   3. the amount of contaminated soil removed and disposed offsite

Upon approval of these revisions and the closure plan, a finalized copy of the plan, including revisions, will be submitted.

Thank you for your prompt attention. If you have any questions regarding these revisions, please do not hesitate to call.

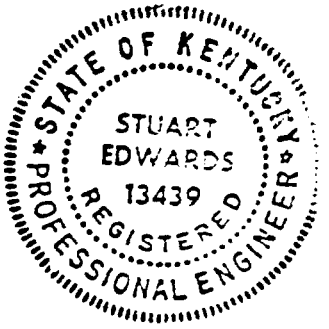
Yours truly,

DAMES & MOORE

Stuart Edwards

Stuart Edwards, P.E.
Kentucky Registered Professional
Engineer No. 13439

SE/ds



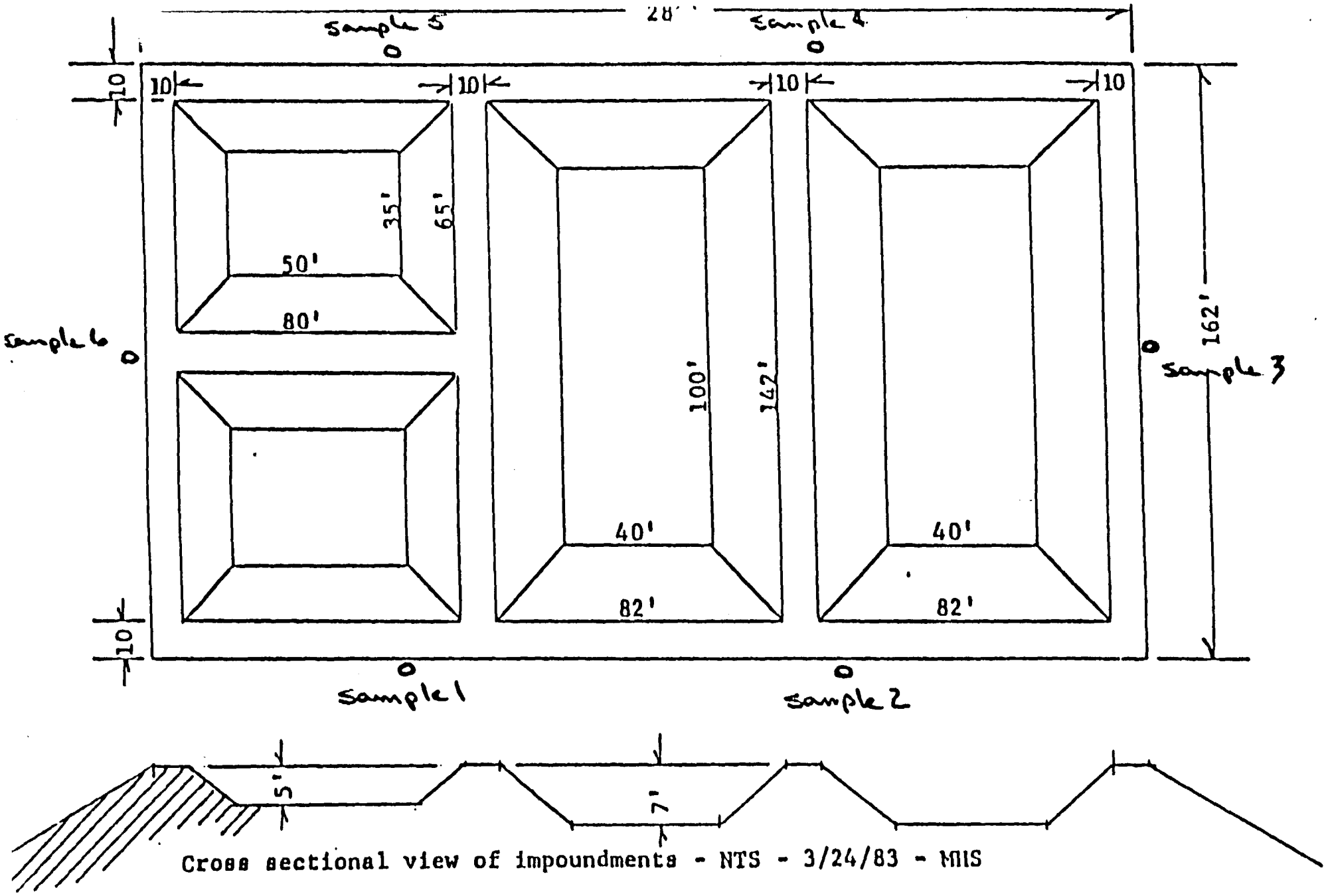


Figure 1
Sample Locations for Background Soil Quality Determination

FINAL CLOSURE CERTIFICATION
WASTE WATER SETTLING PONDS
AND SLUDGE BEDS

EATON CORPORATION
INDUSTRIAL CONTROL DIVISION
BOWLING GREEN, KENTUCKY

DAMES & MOORE
OCTOBER 15, 1984

Dames & Moore

Dames & Moore
644 Linn Street
Suite 501
Cincinnati, Ohio 45203
(513) 651-3440

October 15, 1984

Eaton Corporation
Standard Power Control Division
Bowling Green Plant
2901 Fitzgerald Drive
Bowling Green, Kentucky 42101

Attention: Mr. Mel Smith

Re: Final Closure Certification
Waste Water Settling Ponds
and Sludge Beds

Eaton Corporation
Industrial Control Division
Bowling Green, Kentucky

Dear Mel:

This letter serves as Dames & Moore's Final Certification of Closure of Eaton Corporation's Bowling Green, Kentucky waste water settling ponds and sludge beds as required by 401 KAR 35 and as detailed in the Closure Plan dated June 11, 1984 and the Closure Plan Revision dated June 14, 1984.

As required in the Closure Plan Revision, the following summary is provided:

1. The amount of free liquid present in the surface impoundments prior to closure and the dates removed are shown on Table 1. All supernatant was pumped to the Eaton internal waste treatment plant, treated, and discharged to the Public Owned Treatment Work (POTW). This was performed under a prior agreement with the POTW.

2. The amount of decontamination liquid and accumulated precipitation during closure is shown on Table 2. This liquid was also pumped to the internal treatment facility, treated, and discharged to the POTW.

3. The amount of contaminated sludge and soil including the clay liner and all underlying contaminated soil disposed offsite is shown on Table 3.

The attached certification is provided as required to certify that closure has been done to the best of our knowledge in accordance with the approved closure plan and that all contaminated material has been removed and disposed of in an accepted hazardous waste landfill.

Underlying contaminated soil was identified by a comparison of chemical analyses of the underlying soil with background levels. Background levels for cadmium, hexavalent chromium, free cyanide and nickel were determined by compositing six samples obtained at the locations shown on Figure 1. At the completion of the excavation of all the sludge, and both the clay and artificial liner, a grid was laid out in each impoundment for collection of soil samples. Each sample consisted of 18-24 inches of soil with analyses performed at every 6 inch interval. These sampling locations are also shown on Figure 1. The background levels were determined to be as follows:

Cadmium	3.250 mg/Kg
Cyanide (free)	0.232 mg/Kg
Chromium (hexavalent)	<0.159 mg/Kg
Nickel	29.800 mg/Kg

The levels of the hazardous constituents determined in the underlying soil were compared to the background values in order to determine whether the hazardous constituents had migrated from the impoundments. This comparison was conducted by using two times the background mean as an indicator of contaminated soil. Twice the mean was utilized as an appropriate indicator of contamination based on the definition of the background composite as being a mean value in the area and to allow for laboratory variability in analyses.

Closure, including sludge stabilization and removal and removal of the clay and artificial liner, was accomplished from July 11 to August 3, 1984 after which time soil sampling was conducted. An analysis of the results collected during this investigation revealed several areas where contaminated soil was encountered (North sludge bed - all sampling locations, West settling pond - Locations 1, 3 and 7, South sludge bed - Location 4).

On August 27 and 28, 1984, additional soil was excavated from the above locations to the depths required to remove the contaminated soil. An additional 14 inches was removed from the north sludge bed and an additional 6 inches was removed from the above identified areas in the west pond and the south sludge bed. The areas for excavation were determined by bisecting the distance to each sampling point with its nearest neighbor and included an equivalent thickness from the side slopes. Additional soil samples were obtained from 0-6 inches for verification that all contaminated material had been removed.

An analysis of these results indicated that not all of the contaminated soil had been excavated. On September 11, 1984, sampling was again conducted to a total depth of 24 inches at each sampling location still indicating contamination (the north sludge bed and Location 4 in the south sludge bed) to provide an indication of the depth required for further excavation. On September 27 and 28, 1984, additional soil was excavated for disposal and a final soil sampling was conducted to a total depth of 24 inches. Excavation was conducted to the following depths utilizing the nearest neighbor bisection procedure:

North Pond - Location 1 - 8 inches
Location 2 - 10 inches
Location 3 - 20 inches
Location 4 - 24 inches

South Pond - Location 4 - 16 inches

Analytical results of this final soil sampling indicated that all underlying contaminated soil had been removed. The complete chemical data is shown on Tables 4 through 27 and the volumes of soil excavated are shown on Table 3.

* * *

We have enjoyed working with you on this project and look forward to assisting you in the future. If you have any questions regarding the included information or concerning this certification, please do not hesitate to call.

Yours truly,

DAMES & MOORE

Stuart Edwards

Stuart Edwards, P.E.
Associate

SE:kjg

Attachments

I, Stuart Edwards , a Registered Professional Engineer, hereby certify that visual inspections of closure activities at the Waste Water Settling Ponds and Sludge Beds, Eaton Corporation, Bowling Green, Kentucky have been performed under my direct supervision and that, to the best of my knowledge and belief, closure has been performed in accordance with the closure plan for the facility approved by the Natural Resources and Environmental Protection Cabinet, Department for Environmental Protection, of the Commonwealth of Kentucky.

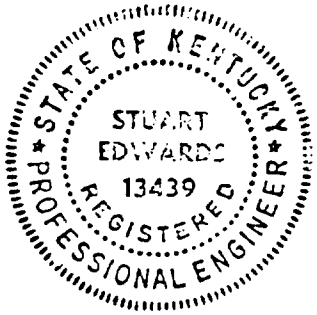
Signature — October 15, 1984
Date

13439
Kentucky Professional Engineer License Number

644 Linn Street
Address
Suite 501

Cincinnati, Ohio 45203

(513) 651-3440
Phone



CHARLOTTE E. BALDWIN
SECRETARY

MARTHA LAYNE COLLINS
GOVERNOR

COMMONWEALTH OF KENTUCKY
NATURAL RESOURCES AND ENVIRONMENTAL PROTECTION CABINET
DEPARTMENT FOR ENVIRONMENTAL PROTECTION
FORT BOONE PLAZA
18 REILLY ROAD
FRANKFORT, KENTUCKY 40601

October 9, 1984

Mr. M.H. Smith
Sr. Project Engineer
Eaton Corporation
2901 Fitzgerald Industrial Drive
Bowling Green, Ky. 42101

RE: Application #84-141, Actual Closure Plan for Hazardous Waste Facility EPA I.D. #KYD09-895-0306

Dear Mr. Smith:

The Division of Waste Management approves the extension of time to complete closure as requested by your letter of September 18, 1984. Decontamination of soil underlying the lagoons and certification by an independent Professional Engineer must be completed by October 19, 1984. The approval of the additional time is consistent with 401 KAR 35:070 Section 4 since all of the sludges were removed within ninety days and total time to close will be less than 180 days (reference: telephone conversation between Mr. Mel Smith and Mr. George Gilbert of October 5, 1984).

As stated in your letter, Eaton Corporation is relieved of complying with Part B submittal requirements.

If you have any questions, please contact Mr. George Gilbert, P.E., at (502) 564-6716, Ext. 237.

Sincerely,

J. Alex Barber, Director
Division of Waste Management

JAB:GFG:cg

cc: Don Curry, Area Supervisor

Eaton Corporation
Standard Power Control Division
Bowling Green Plant
2901 Fitzgerald Industrial Dr.
Bowling Green, KY 42101
Telephone (502) 782-1555

September 18, 1984

Mr. George Gilbert, P.E.
Environmental Engineer
Division of Waste Management
18 Reilly Road
Fort Boone Plaza
Frankfort, KY 40601

Reference: Hazardous Waste Facility, I.D. #KYD098950306

EATON

Dear Mr. Gilbert:

This is in response to your request made September 17 during our telephone conversation concerned with Surface Impoundment Closure.

If my understanding is correct, we are relieved from Part B submittal requirements since we have advised you of our intent to close and have an approved closure plan as well.

In that plan, it was estimated that project completion would occur "within 14 working days of stabilization and removal." We have not met that requirement for various reasons including problems arising from truck procurement, truck unload schedules, and several inches of precipitation.

Therefore, this is to request your approval of an extension of our completion date to October 19, 1984, although every effort will be made to achieve certified closure at an even earlier point in time.

Your consideration of this request will be greatly appreciated.

Sincerely,

M H Smith

M.H. Smith
Sr. Project Engineer

CHARLOTTE E. BALDWIN
SECRETARY

MARTHA LAYNE COLLINS
GOVERNOR

COMMONWEALTH OF KENTUCKY
NATURAL RESOURCES AND ENVIRONMENTAL PROTECTION CABINET
DEPARTMENT FOR ENVIRONMENTAL PROTECTION
FORT BOONE PLAZA
18 REILLY ROAD
FRANKFORT, KENTUCKY 40601

August 6, 1984

Mr. Mel Smith
Eaton Corporation
P.O. Box 1158
Bowling Green, Kentucky 42101

RE: Application #84-141, Actual Closure of Hazardous Waste Facility EPA I.D. #KYD09-895-0306

Dear Mr. Smith:

The Division of Waste Management has not received any public comments concerning the advertisement published in the Bowling Green Daily News on June 28, 1984. With the expiration of the thirty day comment period required by 401 KAR 35:070 Section 3 (similar to 40 CFR 265.112 (d)), Eaton Corporation is hereby authorized to proceed with execution of the closure plan approved by my letter of June 20, 1984.

A copy of the public notice(s) is being forwarded to U.S. EPA Region IV per the current Memorandum of Agreement.

If you have any questions, please feel free to contact Mr. George F. Gilbert, P.E., at (502) 564-6716, Ext. 237.

Sincerely,

J. Alex Barber c.m.

J. Alex Barber, Director
Division of Waste Management

JAB:GFG:cg

cc: Don Curry, Area Supervisor
James Scarbrough, U.S. EPA Region IV

CHARLOTTE E. BALDWIN
SECRETARY

MARTHA LAYNE COLLINS
GOVERNOR

COMMONWEALTH OF KENTUCKY
NATURAL RESOURCES AND ENVIRONMENTAL PROTECTION CABINET
DEPARTMENT FOR ENVIRONMENTAL PROTECTION
FORT BOONE PLAZA
18 REILLY ROAD
FRANKFORT, KENTUCKY 40601

June 20, 1984

Mr. Mel Smith
Eaton Corporation
P.O. Box 1158
Bowling Green, Kentucky 42101

RE: Application #84-137, Actual Closure Plan for Hazardous Waste Facility EPA I.D. #KYD09-895-0306

Dear Mr. Smith:

The Division of Waste Management approves the closure plan submitted June 13 and 14, 1984. The plan meets the requirements of 401 KAR 35:070 (similar to 40 CFR 265 Subpart G).

A public notice is enclosed for one-time publication in a newspaper of general circulation in the county where the facility is located. Have the publisher forward the affidavit of publication to: Ms. Caroline Patrick Haight, Manager, Permit Review Branch, Division of Waste Management, 18 Reilly Road, Frankfort, Kentucky 40601.

The facility owner/operator is responsible for the cost of the legal notice. The public comment period will expire thirty (30) days from the date of publication as dictated by 401 KAR 35:070 Section 3(4) (identical to 40 CFR 265.112(d)). The Division of Waste Management will inform you of any comments and a notice to proceed with certification of closure at the end of the specified time.

Work on actual closure may proceed with the understanding that a relevent public comment may trigger additional requirements before certification is accepted.

If you have any questions, please contact Mr. George F. Gilbert, P.E., at (502) 564-6716, Ext. 237.

Sincerely,

J. Alex Barber, Director
Division of Waste Management

JAB:GFG:cg

cc: Don Curry, Area Supervisor
Stuart Edwards, Dames & Moore, 644 Linn Street, Suite 501, Cincinnati, Ohio 45203

PUBLIC NOTICE

Eaton Corporation of 2901 Industrial Drive, Bowling Green, Kentucky 42101, has submitted a plan to Kentucky Natural Resources and Environmental Protection Cabinet to close an existing hazardous waste facility located at the plant. The manufacturing plan itself will remain open and continue to conduct normal operations. More additional information concerning environmental safeguards are contained in Eaton's hazardous waste facility closure plan on file with the Division of Waste Management in Frankfort.

The hazardous waste facility to be closed is a surface impoundment which has held wastewater treatment sludges from electroplating operations, EPA Waste Number F006. Eaton formerly used the four basins as a part of the NPDES permitted wastewater treatment process. On June 15, 1982, Eaton began using a more technically advanced "Phase II" wastewater treatment plant which discharges to the local sanitary sewer. No need for the ponds now exist.

Eaton is draining all free liquids from the impoundments to the wastewater treatment unit. CECOS, a licensed contractor, will treat and remove all electroplating sludge to an out-of-state permitted landfill. All soil contaminated above background levels will also be removed to the same landfill.

No wastes from outside the plant has ever been accepted at the facility.

Any person who may be aggrieved by the closing of this existing hazardous waste facility may file with the Cabinet written comments setting forth the grounds of the objection as allowed by 401 KAR 35:070 Section 3(4) identical to 40 CFR 265.112(d)) or a petition stating the objection and demand a hearing pursuant to KRS 224.081(2). The written comments or petition may be sent to: Director, Division of Waste Management, 18 Reilly Road, Frankfort, Kentucky 40601.

Dames & Moore

644 Linn Street
Suite 501
Cincinnati, Ohio 45203
(513) 651-3440

June 14, 1984

Mr. George Gilbert
Natural Resources and Environmental Protection Cabinet
Department for Environmental Protection
Division of Waste Management
Fort Boone Plaza
18 Reilly Road
Frankfort, KY 40601

Dear George:

Closure Plan Revision
Wastewater Settling Ponds and Sludge Beds
Eaton Corporation
Industrial Control Division
Bowling Green, Kentucky

In regards to a telephone conversation of June 14, 1984 between Mr. George Gilbert, Kentucky Division of Waste Management, and Mr. Steve Lamb of Dames & Moore regarding revisions to the Easton Wastewater Settling Pond and Sludge Beds closure plan, we are submitting this letter as the revisions to the closure plan.

The necessary revisions concern the handling of wastewater and the soil sampling program for closure certification.

1. All wash fluids collected from truck and equipment cleaning will be directed to the Eaton wastewater treatment facility.

2. Background soil samples will be obtained and analyzed for cadmium, hexavalent chromium, nickel, and cyanide (free) (40 CFR 261 Appendix VIII, F006). Six samples will be obtained for compositing. Each sample will be collected from a minimum depth of 12 inches to ensure collection (below the topsoil) and composited for analysis. Proposed collection points are indicated on Figure 1.

   At the completion of excavation of all the contained sludge, clay, and artificial liner in each impoundment area, CECOS Environmental shall grid each impoundment at 30-foot intervals resulting in four samples from within both the south and north sludge beds and eight from within the west and east settling ponds. Each sample will consist of 2-foot-deep plug samples, extracted, and isolation of samples at the surface and 6-inch intervals. All samples will be properly containerized and logged per chain-of-custody requirements for shipment to CECOS Environmental's subcontracted laboratory in Dayton, Ohio.

A. Surface samples: analysis of all samples for cadmium, chromium, nickel and free cyanide

B. Each 6-inch sample, as required: analysis of samples for the above parameters as determined by analysis of the surface samples

If the results indicate that mobile contaminants have penetrated below the impoundment bottom as determined by comparison with background soil quality, excavation will be conducted to ensure removal of contaminated soil. The backhoe and loader will be utilized to remove 6-inch "lifts" as required, excavating and loading approximately 26 truckloads per day. As such, each 6-inch lift can be removed in 1-1/2 working days.

Removal and disposal of all contaminated soil will be performed within 14 working days of stabilization and removal of the sludge.

3. All equipment used for excavating sludge and liner will be cleaned after removal of the sludge and following the removal of each 6-inch lift during removal of the clay liner and any further excavation of contaminated soil. As above, all wash fluid will be directed to the plant wastewater treatment facility.

4. Final certification will include:

   1. estimate of the amount of free liquid present in the surface impoundments prior to removal, date removed, and the treatment employed for disposal

   2. estimate of decontamination liquid, and accumulated precipitation during closure and their disposal methods (plant wastewater treatment facility)

   3. the amount of contaminated soil removed and disposed offsite

Upon approval of these revisions and the closure plan, a finalized copy of the plan, including revisions, will be submitted.

Thank you for your prompt attention. If you have any questions regarding these revisions, please do not hesitate to call.

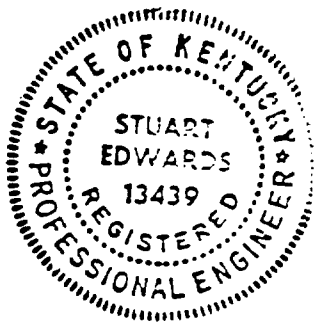
Yours truly,

DAMES & MOORE

Stuart Edwards

Stuart Edwards, P.E.
Kentucky Registered Professional
Engineer No. 13439

SE/ds



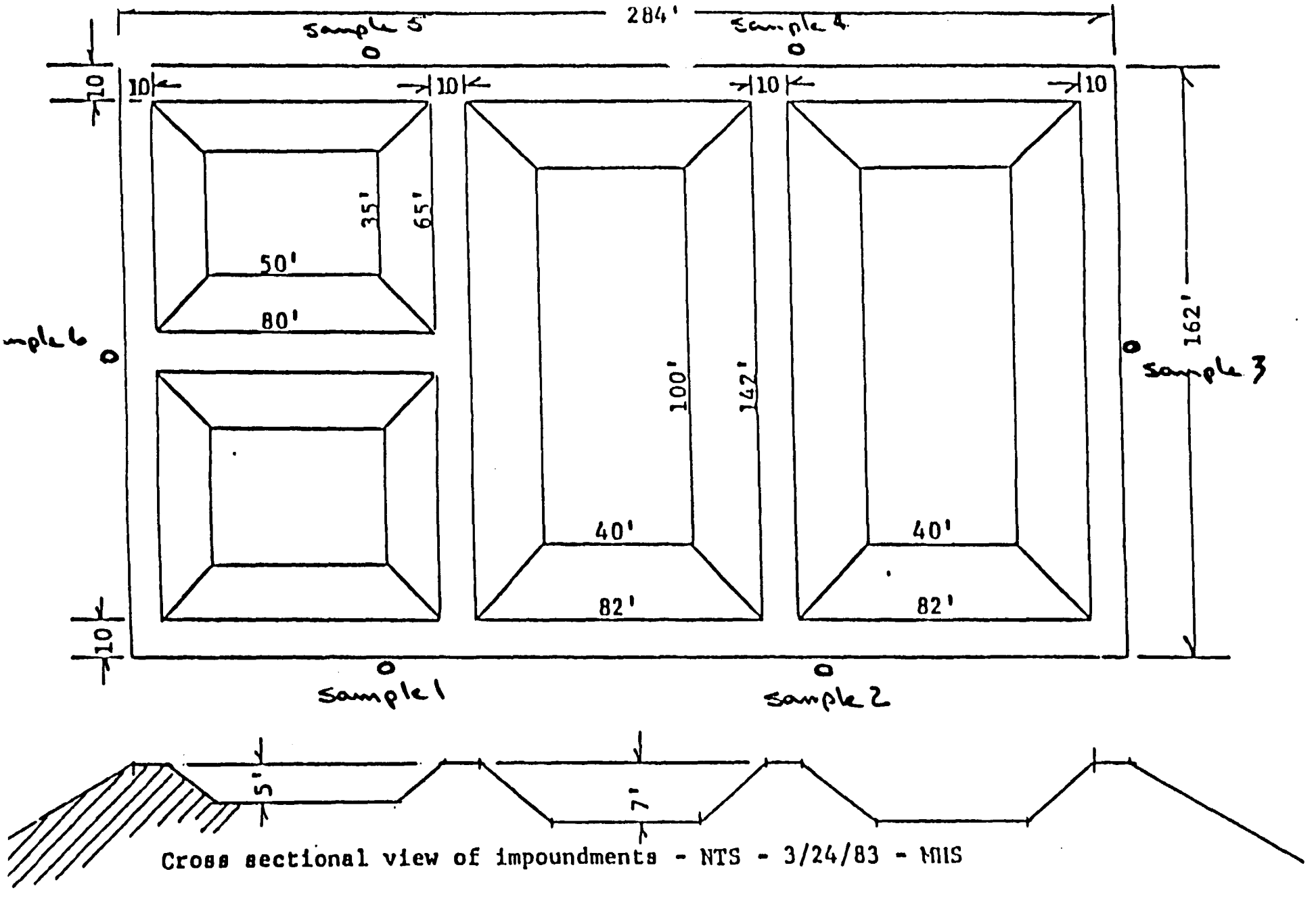


Figure 1
Sample Locations for Background Soil Quality Determination

CLOSURE PLAN
WASTEWATER SETTLING PONDS AND SLUDGE BEDS
EATON CORPORATION
INDUSTRIAL CONTROL DIVISION
BOWLING GREEN, KENTUCKY

JOB NO. 12461-007-17
JUNE 11, 1984

Dames & Moore

TABLE OF CONTENTS

I hereby certify that this plan for the closure of the settling ponds and sludge beds at Eaton Corporation, Industrial Control Division's Bowling Green, Kentucky plant was prepared under by direct supervision.

6/12/84

Stuart Edwards
Registered Professional Engineer
No. 13439

INTRODUCTION

The water treatment system at the Eaton Corporation, Industrial Control Division facility in Bowling Green, Kentucky includes four wastewater treatment impoundments which are considered as hazardous waste facilities under the 1976 Resource Conservation and Recovery Act (RCRA). These are presently regulated under Interim Status by the Kentucky Administrative Regulations, 401 KAR 35 standards.

A Phase II waste treatment system was brought "on-line" on June 15, 1981 (negating the further need for surface impoundments), and no additional wastes have been placed in the impoundments since that date. This new system resulted in:

1. A considerable amount of reuse water
2. Discharge to the POTW of filtrate (which is monitored by the POTW and Eaton) under a permit with them
3. The production of filter cake with disposal in a secure site in accordance with all applicable Kentucky DNR regulations

This plan is designed to permit closure under the Interim Status standards and, as such, remove the facility from further regulation as a hazardous waste management facility. Closure is to be accomplished by removing all the impounded materials and contaminated soils as per 401 KAR 35:200(6) (Closure and Post-Closure Surface Impoundments). Site closure to meet these requirements involves the following general components:

- Pumping of free liquids, if any
- Cleaning out of accumulated sludges
- Removal of contaminated soil, if any
- Site grading compatible with future anticipated land use

SITE DESCRIPTION

Eaton Corporation's Industrial Control Division facility is located approximately 1 mile south of Bowling Green in the Mississippian Plateau area of Kentucky. This area is a slightly rolling karst plain characterized by few streams and numerous sinkholes.

The ground surface in the wastewater treatment area is essentially level due to grading during plant construction when up to 7 feet of fill was placed to bring the ground elevation to approximately 37 feet (plant datum). The impoundments were then constructed within the fill and the upper few feet of natural soils. North of the impoundment dikes, the ground surface slopes to a lake on the plant property.

The soils overlying bedrock at this site consist of up to 7 feet of clay fill, and original surficial clay soils up to 7 feet thick. The underlying bedrock consists of the Ste. Genevieve Limestone of Upper Mississippian age. The limestone is light gray and contains numerous voids and fractures. This limestone is the uppermost water-bearing zone at the site where ground water occurs within the fractures and voids.

Natural shallow ground water in the vicinity of the wastewater treatment facilities is generally suitable for use as a water supply. The ground water sampling program has shown that there is no evidence of the hazardous waste constituents (nickel or cyanide) in the ground water (Appendix B, RCRA Ground Water Monitoring Semi-Annual Report).

FACILITY CHARACTERISTICS

The impoundments consist of two settling ponds where relatively clean water--possibly containing some precipitated metals--was discharged to one of the ponds so that the precipitated material could settle. The ponds served as clarifiers.

This system also provided two sludge beds to which the sludges generated in the batch treatments, and those drawn from the bottom of the closed loop reservoirs were directed for settling and thickening. The

The chemical characteristics of the sludge have been evaluated (laboratory analysis provided by Eaton, see Appendix C), indicating the following total metallic concentrations based upon sampling performed on May 11, 1981:

	Concentration (ppm)	
	Composite 1[1]	Composite 2[2]
Cadmium	210	210
Chromium (total)	750	725
Copper	625	675
Nickel	840	880
Lead	37.5	37.5
Zinc	2,500	4,750
Silver	0.55	0.57
Tin	150	140
Barium	110	135

EP toxicity results on the sludge from the same event were:

	Concentration (ppm)	
	Composite 1[1]	Composite 2[2]
Barium	7.0	9.0
Cadmium	3.2	7.5
Chromium	0.45	0.45
Arsenic	0.025	0.040
Tin	<0.005	<0.005
Lead	<0.5	<0.5
Mercury	0.0011	<0.0002
Silver	0.12	0.10

Physical tests by CECOS in May 1984 indicate that the sludge, prior to any dewatering efforts, has a unit weight of 64.3 to 66.1 pounds per cubic foot.

CLOSURE PLAN

Closure of the wastewater treatment ponds and sludge beds will be conducted by CECOS Environmental employing sludge-handling methods and procedures to provide the maximum safety to onsite personnel, while maintaining total compliance with local, state, and federal regulations. This is done by using trained professionals equipped with proper safety equipment.

[1] Composite from north sludge bed.
[2] Composite from south sludge bed.

Closure of the basins will consist of:

1. The air support structure will be removed. Plastic sheeting will be placed over the impoundments to prevent contamination during removal. The sheeting will then be disposed of in the offsite hazardous waste landfill.

2. Influent piping from the plant to both the sludge beds and settling ponds will be flushed from the building with high caustic-content soap and water to emulsify any sediment, followed by a water rinse. All rinse-out liquids will be directed to the plant treatment system. The piping will then be plugged at both the plant end and near the distribution boxes.

3. The sludge will be stabilized by solidifying with lime kiln flue dust.[3] Estimated volumes and weight for the four beds is:

   A. North and South Sludge Beds

Estimated total volume	576 cubic yards
Estimated bulk density	1,735 pounds/cubic yard
Total weight	499.7 tons
Pozzalime requirements	150 tons (30 percent wt/wt)
Total weight for disposal	649.7 tons

   B. West Settling Pond

Estimated total volume	990 cubic yards
Estimated bulk density	1,785 pounds/cubic yard
Total weight	883.6 tons
Pozzalime requirements	220 tons (25 percent wt/wt)
Total weight for disposal	1,103.6 tons

   C. East Settling Pond

Estimated total volume	583 cubic yards
Estimated bulk density	1,825 pounds/cubic yard
Total weight	541.1 tons
Pozzalime requirements	90 tons (17 percent wt/wt)
Total weight for disposal	631.1 tons

   D. Clay Liner

Estimated total volume	1,248 cubic yards
Estimated bulk density	2,500 pounds/cubic yard
Total weight for disposal	1,560 tons

The stabilized sludge, 12-inch compacted clay liner, and artificial liner will be removed to the CECOS approved hazardous waste landfill for disposal. As a generator of hazardous waste, all

[3] Lime kiln flue dust is marketed under the trade name Pozzalime by Mineral By-Products, Inc., 8070 Condor Court, Centerville, OH 45459 (513) 435-3194.

applicable requirements of 40 CFR 262, 263, and 265 will be observed. These requirements cover manifesting the material to be transported and reporting protocols.

The following materials, equipment, and manpower will be used for the sludge solidification, excavation, transportation, and disposal:

A. Equipment van
B. Chemical technician
C. Backhoe with operator
D. Loader with operator
E. Personal safety equipment
F. All materials required for construction of the truck cleaning station
G. High-pressure spray cleaner
H. High calcium oxide pozzalime

CECOS Environmental shall also supply the required bulk trailers for transport of the solidified material.

A truck and equipment cleaning station will be constructed onsite the first working day for removal of any exterior contamination on all vehicles leaving the project area. This station will be a double-lined gravel pit 60 feet by 10 feet by 6 to 8 inches deep. All wash fluids will be collected as they accumulate and pumped to the impoundment area or to wastewater treatment facilities as directed by Eaton. After project completion, this wash station will be removed and disposed of as hazardous at CECOS Secure Chemical Management Facility.

Both the backhoe and loader will be utilized the first and second working day to accumulate an inventory of solidified material (no free liquid, no slump) and all visually detectable contaminated soil.

Solidification will begin in either the north or south sludge bed. Solidification and excavation procedures will be comparable at all four impoundment areas regardless of the starting point.

Loading of bulk trailers will commence the third working day between 8:00 a.m. and 2:45 p.m. The loader will be utilized primarily for this function, with the backhoe solidifying and providing stockpiled material for loading.

Stockpiled material will be allowed to cure for approximately 48 hours prior to loading. Utilizing this approach provides the most efficient use of solidification agent.

All sludge materials and clay liner will be removed in 8 days after the 2 days of solidifying and stockpiling. To accomplish this, CECOS Environmental will be removing approximately 24 trucks per day.

4. At the completion of excavation of all the contained sludge, clay, and artificial liner in each impoundment area, CECOS Environmental shall grid each impoundment at 30-foot intervals resulting in four samples from within both the south and north sludge beds and eight from within the west and east settling ponds. Each sample will consist of 2-foot-deep plug samples, extracted, and isolation of samples at the surface and 6-inch intervals. All samples will be properly containerized and logged per chain-of-custody requirements for shipment to CECOS Environmental's subcontracted laboratory in Dayton, Ohio.

   The following methodology will be used for analysis of samples:

   A. Surface samples: analysis of all samples for EP toxicity and cyanide

   B. Each 6-inch sample, as required: analysis of samples for parameters above RCRA limits as determined by analysis of the surface samples

   If the results indicate that mobile contaminants have penetrated below the impoundment bottom, excavation will be conducted to ensure removal of contaminated soil.[4] The backhoe and loader will be utilized to remove 6-inch "lifts" as required, excavating and loading approximately 26 truckloads per day. As such, each 6-inch lift can be removed in 1-1/2 working days.

5. All influent and effluent distribution boxes will be treated as hazardous and removed to the landfill. The 6-inch effluent pipe will be removed, crushed, and used as fill in the final grading.

6. Final grading will consist of returning the site to approximate original contour as shown on Plate 1, followed by revegetation.

7. The ground water monitoring system will be removed, and the wells plugged with concrete after final certification and approval.

8. All equipment used in removal of contaminated soil and filter material (backhoe) will be steam-cleaned at the site, with the water being directed to the waste treatment facility.

GROUND WATER MONITORING

Ground water monitoring will be continued during the closure period in accordance with the sampling and analysis plan (Appendix A, Ground Water

[4] Contaminated soil is defined as soil that is classified as hazardous using the EP toxicity test.

Sampling and Analysis Plan) if closure has not been completed and certification approved prior to the semi-annual sampling event scheduled for August 1984.

Monitoring wells will be maintained during closure activities, and any refitting necessary due to regrading will be performed to ensure ground water monitoring capabilities. Following certification and final approval by the Department of Natural Resources and Environmental Protection, all monitoring wells will be plugged and surface expression removed.

CLOSURE CERTIFICATION

Closure certification will be provided by Eaton Corporation and by an independent professional engineer (Dames & Moore, Cincinnati, Ohio) upon completion. These certifications are to ensure that closure is done in accordance with the approved closure plans. To enable the independent engineer to certify the closure, periodic field observation will be required during key closure activities.

SCHEDULE

Closure will commence upon Department of Natural Resources final approval of this closure plan, with completion within 14 working days of stabilization and removal.

Hector Kitscha
Vice President

Eaton Corporation
Industrial Control and
Power Distribution Operations
4201 North 27th Street
Milwaukee, Wisconsin 53216
Telephone (414) 449-6091

October 18, 1984

Mr. George Gilbert, P.E.
Division of Waste Management
18 Reilly Road
Fort Boone Plaza
Frankfort, KY 40601

Dear Mr. Gilbert:

This is to certify that the Surface Impoundment Storage Facility located at our Eaton Plant in Bowling Green, Kentucky, has been closed in accordance with the specifications in the approved closure plan.

Sincerely,

H. Kitscha
Vice President
Industrial Control and
Power Distribution Operations

HK/kr

cc: D. M. Adams
R. A. Burtt
M. H. Smith
D. F. Engstrom

December 11, 1984

Mr. H.Kitscha, Vice President
Eaton Corporation
Industrial control and
Power Distribution Operations
4201 North 27th Street
Milwaukee, Wisconsin 53216

RE: Application #84-141, Actual Closure of Hazardous Waste Facility EPA I.D. #KYD09-895-0306, Bowling Green, Kentucky

Dear Mr. Kitscha:

The Division of Waste Management approves your closure certification correspondence dated October 18, 1984, and that of Mr. Stewart Edwards, P.E., from Dames and Moore, dated October 15, 1984. The two declarations satisfy 401 KAR 35:070 Section 6 for owner and independent professional engineer certification of closure.

Eaton Corporation, Standard Power Division in Bowling Green is no longer considered a hazardous waste facility by the Commonwealth of Kentucky.

If you have any questions, please contact Mr. Geroge Gilbert, P.E., at (502) 564-6716, Ext. 237.

Sincerely,

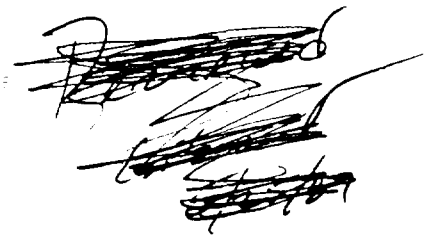
J. Alex Barber, Director
Division of Waste Management

JAB:GFG:cg

cc: Don Curry, Area Supervisor
Mel Smith, Eaton Corporation, 2901 Industrial Drive, Bowling Green, Ky. 42101
Stuart Edwards, P.E., Dames and Moore, 644 Linn Street, Suite 501, Cincinnati, Ohio 45203

prc

Planning Research Corporation



INSPECTION TO ASSESS COMPLIANCE WITH CLOSURE/POST CLOSURE REQUIREMENTS AT EATON CORPORATION BOWLING GREEN, KENTUCKY KYD098950306

DRAFT FINAL REPORT

Prepared for

U.S. ENVIRONMENTAL PROTECTION AGENCY
Office of Waste Programs Enforcement
Washington, D.C. 20460

Work Assignment No.	:	536
EPA Region	:	4
Site No.	:	None (R)
Date Prepared	:	April 23, 1987
Contract No.	:	68-01-7037
PRC No.	:	15-5360-00
Prepared By	:	Alliance Technologies Corporation
Telephone No.	:	(617) 275-5444
EPA Primary Contact	:	Doyle Brittain
Telephone No.	:	(404) 347-7603

CONTENTS

LIST OF FIGURES

LIST OF TABLES

SECTION 1
INTRODUCTION

Regulations promulgated under the Resource Conservation and Recovery Act (RCRA) require that operators of hazardous waste management facilities have a written closure plan approved by the U.S. Environmental Protection Agency or appropriate State regulatory agency. The regulations also detail specific requirements for the closure and post closure care of such facilities. Under a work assignment for the U. S. Environmental Protection Agency Region IV Waste Compliance Section (EPA Contract No. 68-01-7037, Work Assignment 536), GCA Technology Division, Inc. inspected facilities in EPA Region IV where some or all of the waste management operations have been closed. The purpose of these inspections was to determine whether the facility operators followed their approved closure plans and complied with the requirements of RCRA in closing waste management units.

The Eaton Corporation plant in Bowling Green, Kentucky (KYD098950306) closed four RCRA surface impoundments in 1984. On July 31, 1985, Messrs. William Battye, P.E., and David Misenheimer, of GCA Technology Division, inspected the Eaton plant and the closed RCRA facilities. The GCA inspectors were accompanied by Mr. George Gilbert, P.E., of the Kentucky Department of Environmental Protection Frankfurt Office, and Mr. Jack Watkins of the Bowling Green District Office. Mr. Mel Smith, Eaton Corporation Plant Engineer, provided information on the closures and on current operations at the Eaton Bowling Green plant. Mr. David Rogers, Eaton's Human Resources Supervisor, also was present at the inspection. Mr. Rogers is expected to take responsibility for RCRA compliance at the Bowling Green plant after Mr. Smith's retirement.

In addition to inspecting the Eaton plant, GCA personnel reviewed RCRA files at the Kentucky Department of Environmental Protection Office in Frankfort. Mr. Battye also contacted Mr. Stuart Edwards, P.E., of Dames and Moore, Inc., to discuss closure activities. Dames and Moore was retained by Eaton to provide technical support during the closure, and Mr. Edwards provided the final P.E. certification of closure.

The remainder of this report is divided into five sections: Section 2 - Facility Description; Section 3 - Closure Plan and Chronology; Section 4 - Inspection Findings; Section 5 - Conclusions; and Section 6 - References. Also included are four Appendices: Appendix A - Inspection Notes and Checklist; Appendix B - Photographs; Appendix C - Documents from File Review; and Appendix D - Other Documents. References listed in Section 6 may also be reproduced in Appendices C and D.

SECTION 2
FACILITY DESCRIPTION

GENERAL

The Eaton Standard Power Control Division plant in Bowling Green, Kentucky, produces electrical devices, including switch boxes, contactors, timers, and relays. The plant has been in operation since 1965. The plant has several plating, metal finishing, and solvent cleaning operations that generate wastewater, solid wastes, and waste solvents.

WASTEWATER TREATMENT AND WASTE HANDLING

Wastewater treatment operations used at the Eaton plant are classified by plant personnel into Phase I and Phase II treatment processes. Phase I processes are the initial treatment steps for plating wastewaters and other process wastewater. These include two separate continuous treatment systems for chromium wastewaters and cyanide wastewaters. In addition, batch treatment operations are used for other process wastewaters.

The Phase II operations include a treatment operation for clean wash water, and the final treatment processes for sludges generated in the Phase I systems. The Phase II operations were installed in 1981 and replaced the now closed surface impoundments.

Currently, in the Phase II sludge treatment system, sludge is pumped to one of three tanks. Sludge from the tanks is pumped through a filter press. Filtrate from the press is discharged to the Bowling Green POTW. The filter cake is collected in a hopper, and then bagged when the hopper is full. Bags are shipped out by truck within the 90 day RCRA limit. Approximately one truckload (about 20 tons) is shipped every 90 days. The filter cake is shipped to the Chem Waste Management landfill in Emelle, Alabama. The plant is considering a sludge dryer that would reduce the volume of sludge from the filter press by a factor of about four.

Clean wash water is pumped to a liming tank, followed by a flocculation tank and a clarifier. Sludge from the clarifier is pumped to the filter press, and water from the clarifier is discharged to the Bowling Green POTW.

In addition to the filter cake from plating wastewater, the Eaton plant generates spent chlorinated and non-chlorinated solvents from solvent cleaning operations. The solvents are drummed and sent to the LWD incinerator in Calvert City, Kentucky. Waste is also generated in periodic cleanings of the wastewater sumps. Precipitate from the sumps may be sent to either Chem Waste Management or LWD.

Prior to installation of the Phase II treatment systems, the four closed surface impoundments were used to treat the plant wastewater and sludge. Plant wastewater was piped to two settling impoundments. These discharged through a discharge pond to a sinkhole, under an NPDES permit. Sludge from Phase I treatment systems was piped to two sludge drying beds. Water from the beds overflowed into the settling impoundments.

SECTION 3
CLOSURE PLAN AND CHRONOLOGY

Use of the impoundments at the Eaton plant began during the construction of the plant in 1966. Figure 1 shows the sizes and relative locations of the impoundments. Each of the two sludge beds was 35 feet by 50 feet, and each of the two settling ponds was 40 feet by 100 feet. The impoundments were used to treat plating wastewaters and sludges (F006). The impoundments were deactivated in 1981 following the installation of the Phase II wastewater treatment system. Eaton and the State of Kentucky debated the action to be taken on the deactivated impoundments from 1981 to 1983. On March 21, 1983, Eaton proposed to remove and treat the standing water in the impoundments and to cover the impoundments while studying various options for treating the remaining sludge.[1] This plan was approved by the State of Kentucky on March 31, 1983.[2]

An inflating building was installed to cover the sludge beds and settling impoundments on July 29, 1983.[3] Removal of standing water from the impoundments was commenced in August 1983. The water was treated in Eaton's wastewater treatment system and discharged to the Bowling Green POTW in accordance with a discharge permit. Sludge was removed from the water in the filter press, and the filter cake was sent to Chem Waste Management.[3] A total of about 100 thousand gallons were removed and treated between August 1983 and July 1984.[3] The inflated building was removed on June 25, 1984,[3] and on June 11, 1984, Dames and Moore, Inc., consultants for Eaton, submitted a closure plan for the deactivated impoundments.[4] After receiving comments from the State, Dames and Moore submitted revisions to the closure plan on June 14, 1984.[5] The revised closure plan was approved by the State of Kentucky on June 20, 1984.[6] An extension of the final closure date until October 19, 1984 was later approved.[7]

The final closure plan called for the stabilization of the sludge with lime kiln flue dust and the removal of the sludge, the liner and any

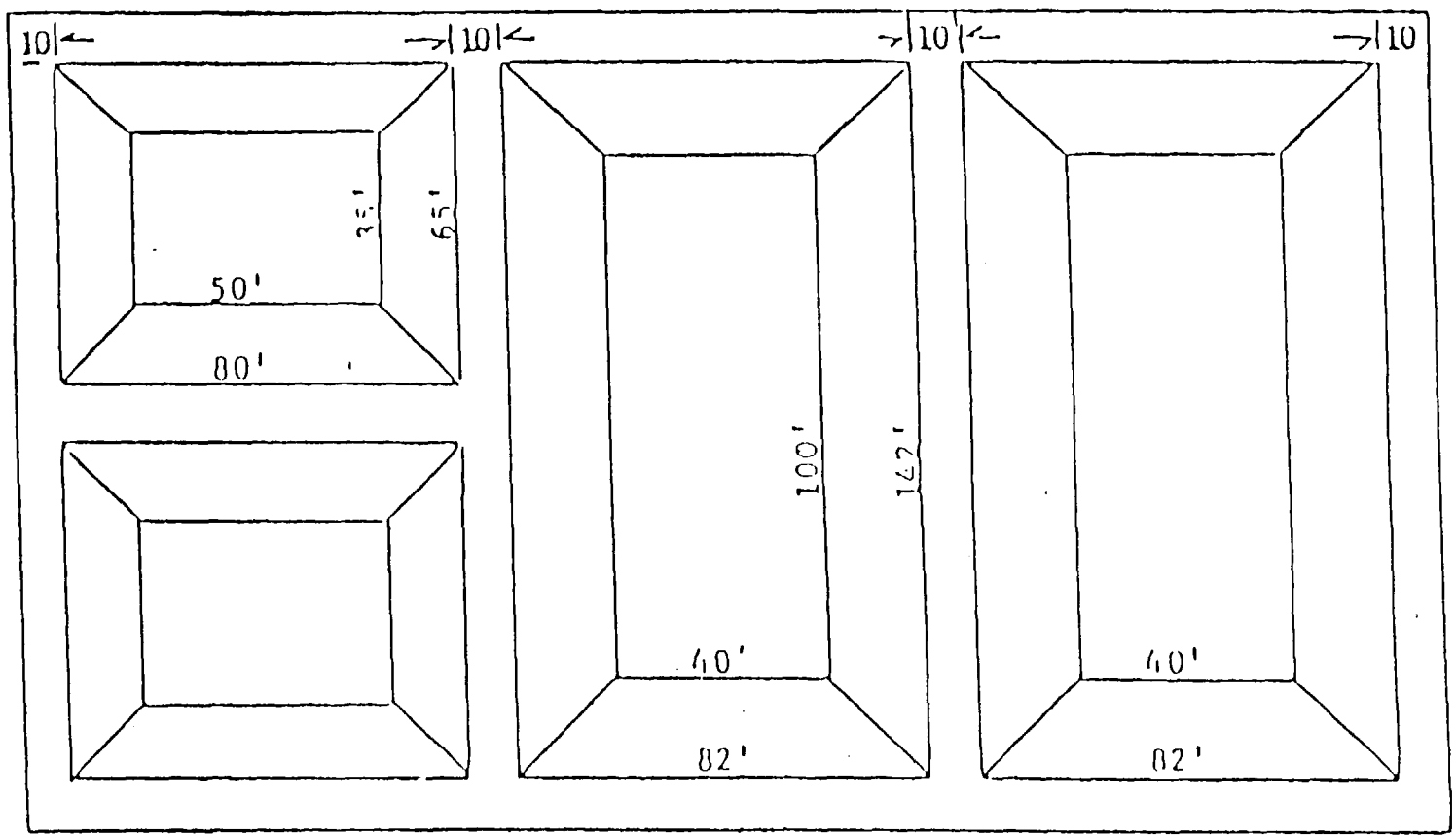


Figure 1. Relative Location of Former Impoundments.
(Source: Dames and Moore Closure Plan)

contaminated soil. The sludge and contaminated material were to be shipped to CECOS Environmental. Soil contamination was to be determined by comparison of metal concentrations with those in background soil.[5]

The sludge was stabilized and removed, with the liner, in July 1984. Soil sampling was conducted on August 27 and 28, and several contaminated areas were identified. The identified areas were excavated, and sampling was repeated on September 11. Additional contaminated soil was removed, and final sampling was conducted on September 27, 1984. All soil samples were analyzed for cadmium, hexavalent chromium, free cyanide and nickel by a laboratory subcontracted to CECOS.

Eaton and Dames and Moore determined that the final sampling showed no further contamination. Because of analytical uncertainty, a concentration of more than twice the measured background was considered to be indicative of contamination.[3] This threshold was approved verbally by the State of Kentucky in a meeting with Dames and Moore prior to the backfilling of the excavated area.[8] On October 15, 1984, Dames and Moore submitted a P.E. certification of closure that included the final analytical results.[3] Owner certification of closure was submitted by Eaton on October 18.[9] The closure certification was approved by the State on December 11.[10]

Groundwater monitoring was conducted by Dames and Moore for 3 years between 1981 and 1984, and no contamination was detected.[11] The first semi-annual groundwater monitoring report is reproduced in Appendix C.[12] Eaton was relieved of its groundwater monitoring requirement in 1985.[11]

SECTION 4
INSPECTION FINDINGS

On July 31, 1986, Messrs. William Battye, P.E., and David Misenheimer, of GCA, inspected the Eaton facility. Completed inspection forms and other notes made during the inspection are reproduced in Appendix A. Photographs taken during the inspection are reproduced in Appendix B. The four impoundments and the discharge lagoon were found to be backfilled, and there was a good grass cover. Manifests were reviewed which indicated that sludge and contaminated soil were hauled to CECOS in Williamsburg, Ohio between July and September 1984. A summary of the manifests is given in the final closure certification.[3]

The final soil analyses prior to backfilling are summarized in Table 1.[3] As the table shows, contaminant levels in some of the individual samples exceeded the 2-times-background threshhold. In some instances, there were duplicate analyses showing contaminant levels below the threshhold. For location S-1 in the South Sludge Basin, the July 30 analysis showed levels below the threshhold, while the August 11 analysis showed free cyanide levels exceeding the threshhold to a depth of 13 inches. However, no material had been removed between July 30 and August 11. For location N-1, duplicate analyses were made, with one analysis showing a nickel concentration above the threshhold and the other showing a nickel concentration below the threshhold.

Mr. Stuart Edwards, P.E., of Dames and Moore, was contacted by telephone regarding the exceedences of the threshholds.[13] Mr. Edwards noted that in the case of location S-2, although the sample to a depth of 6 inches exceeded the threshhold, a weighted average of the first 8 inches would be at the threshhold. He also stated that, because there is no E.P. toxicity standard for nickel, the nickel threshhold was used as a guideline rather than a hard and fast rule. It should be noted that although it is not regulated under E.P. toxicity rules, the presence of nickel was cited as one of the bases for listing plating sludge (F006) as a hazardous waste.[14] Chromium, cyanide, and cadmium were also cited in the listing document.

TABLE 1. SUMMARY OF FINAL SOIL ANALYSES

Sample number & date	Depth (inches)	Contaminant concentration (ppm) Cadmium	Hexavalent Chromium	Free Cyanide	Nickel
BACKGROUND		3.25	< 0.16	0.23	29.8
NORTH SLUDGE BASIN					
N-1	0-6	4.23	< 0.16	< 0.23	57.9
9/27	0-6	1.97	< 0.16	< 0.23	79.6
N-2	0-6	2.07	< 0.16	< 0.23	53.6
9/27					
N-3	0-6	1.61	< 0.16	< 0.23	45.8
9/27					
N-4	0-6	1.52	< 0.16	< 0.23	42.5
9/27	6-8	1.62	< 0.16	< 0.23	32.6
	11-13	1.72	< 0.16	< 0.23	29.6
	16-18	1.73	< 0.16	< 0.23	31.2
	22-24	2.12	< 0.16	< 0.23	25.4
EAST SETTLING POND					
E-1	0-6	1.36	< 0.11	0.13	22.5
7/26	6-8	1.88	< 0.14	< 0.17	26.3
E-2	0-6	0.74	< 0.13	< 0.15	28.4
7/26	6-8	< 0.37	< 0.12	< 0.21	35.1
	11-13	< 0.36	< 0.09	< 0.16	28.2
	16-18	0.43	< 0.08	< 0.08	18.1
E-3	0-6	< 0.43	< 0.12	< 0.11	23.4
7/26	6-8	0.51	< 0.15	< 0.15	27.3
	11-13	0.93	< 0.09	< 0.17	28.8
E-4	0-6	< 0.40	< 0.13	< 0.16	27.6
7/26	6-8	0.88	< 0.09	< 0.14	22.5
	11-13	< 0.34	< 0.08	< 0.07	18.2
	16-18	0.99	< 0.09	< 0.07	21.8
	22-24	1.41	< 0.09	< 0.06	35.0
E-5	0-6	0.48	< 0.10	< 0.13	29.9
7/26	6-8	0.48	< 0.12	< 0.11	49.7
	11-13	0.80	< 0.12	< 0.18	19.9
	16-18	< 0.31	< 0.10	< 0.06	19.9
E-6	0-6	0.52	< 0.15	< 0.16	25.4
7/26	6-8	0.42	< 0.13	< 0.12	39.9
	11-13	0.37	< 0.09	< 0.08	19.9
E-7	0-6	0.34	< 0.11	< 0.13	25.7
7/26	6-8	0.84	< 0.07	< 0.07	25.9
	11-13	1.34	< 0.16	< 0.22	18.1
E-8	0-6	0.41	< 0.12	< 0.13	26.8
7/26	6-8	0.60	< 0.12	< 0.19	26.5
	11-13	1.38	< 0.06	< 0.08	31.4

Sample number & date	Depth (inches)	Contaminant concentration (ppm) Cadmium	Hexavalent Chromium	Free Cyanide	Nickel
SOUTH SLUDGE BASIN					
S-1	0-6	0.65	< 0.16	2.60	38.7
9/11	6-8	0.24	< 0.16	1.88	24.0
	11-13	0.23	< 0.16	2.72	30.6
	16-18	0.27	< 0.16	< 0.23	35.9
S-1	0-6	5.07	< 0.14	0.03	34.2
7/30	6-8	0.79	0.32	0.04	30.6
	11-13	0.53	< 0.12	< 0.16	36.7
	16-18	1.47	< 0.11	< 0.09	43.3
	22-24	1.33	< 0.09	< 0.08	41.8
S-2	0-6	0.64	< 0.12	0.57	51.8
7/30	6-8	1.02	< 0.13	0.13	46.9
	11-13	0.91	< 0.14	< 0.22	39.7
	16-18	2.18	< 0.10	< 0.10	70.7
S-3	0-6	2.67	< 0.15	< 0.23	38.2
7/30	6-8	4.45	< 0.14	< 0.23	53.4
	11-13	0.92	< 0.13	0.38	61.5
	16-18	1.81	< 0.14	0.13	56.9
S-4	0-6	0.50	< 0.16	< 0.23	68.5
9/27					
WEST SETTLING POND					
W-1	0-6	1.84	< 0.11	< 0.10	51.5
8/29	0-6	1.64			48.3
W-2	0-6	0.36	< 0.08	< 0.21	19.3
7/26	6-8	0.45	< 0.13	< 0.15	32.3
	11-13	0.40	< 0.11	< 0.07	29.0
W-3	0-6	0.31	< 0.10	< 0.08	48.7
8/29					
W-4	0-6	0.46	< 0.09	0.18	32.9
7/26	6-8	0.52	< 0.11	< 0.17	33.2
	11-13	0.37	< 0.12	< 0.14	17.6
	16-18	2.41	< 0.12	< 0.08	38.0
W-5	0-6	0.35	< 0.11	< 0.14	27.3
7/26	6-8	0.48	< 0.15	< 0.18	34.8
	11-13	0.26	< 0.08	< 0.16	38.3
W-6	0-6	< 0.34	< 0.13	< 0.16	29.2
7/26	6-8	0.41	< 0.13	< 0.18	26.8
	11-13	0.37	< 0.14	< 0.14	36.7
	16-18	1.47	< 0.11	< 0.18	41.0
	22-24	0.82	< 0.12	< 0.08	27.4
W-7	0-6	0.26	< 0.10	< 0.09	46.9
8/29					
W-8	0-6	< 0.41	< 0.12	< 0.15	26.6
7/26	6-8	< 0.43	< 0.14	< 0.19	31.1
	11-13	< 0.40	< 0.16	< 0.17	32.8
	16-18	< 0.30	< 0.08	< 0.19	17.4

If conflicting duplicate analyses are considered, and the average concentration over 8 inches is used instead of the 6 inch result for S-2, all of the exceedences of the threshholds are accounted for except for the nickel concentrations in S-3 and S-4. Also, if the S-3 nickel concentration for a depth of 16 to 18 inches (which exceeds the threshhold) is averaged with the concentration for 11 to 13 inches, the threshhold is not exceeded. For S-4, only the top 6 inches were sampled. The nickel concentration in the first 6 inches exceeded the threshhold by 15 percent. The use of the nickel threshhold as a guideline instead of a hard rule explains why no more soil was removed at S-4.

As noted in the previous section, the final closure certification was approved by the State of Kentucky. The certification included the analytical results summarized in Table 1. George Gilbert, of the Kentucky Department of Environmental Protection, stated that Eaton had removed soil down to the level of bedrock when the final analyses were done and that the final samples were taken from pockets in the bedrock.[8] The State's protocols for reviewing closure plans and certifications have evolved substantially since the Eaton closure. The State currently requires a Student's t-test, similar to that required for groundwater modeling studies (40 CFR 265 Appendix IV), for all land disposal closures involving listed waste.[8] GCA could not perform a t-test with the Eaton data because only one set of background measurements was made.

It should be noted that threshholds were never exceeded for more than one contaminant in the same sample. Also, the final concentrations of cadmium and nickel were in all cases at least a factor of ten below the concentrations in the original sludge, 210 ppm for cadmium and 860 ppm for nickel.[4] (The sludge samples were not analyzed for cyanide and were analyzed for total chromium instead of hexavalent chromium.) Finally, no contamination was detected in groundwater monitoring over a 3-year period.[11]

SECTION 5
CONCLUSIONS

On July 31, 1986, Messrs. William Battye, P.E., and David Misenheimer, of GCA, conducted a closure/post closure inspection of the Eaton plant in Bowling Green, Kentucky. The following items were noted during the inspection and file review:

- The four closed impoundments and the former discharge lagoon were backfilled, and there was a good grass cover.
- Manifests showed the sludge and contaminated soil had been removed to a permitted hazardous waste landfill. Plant personnel indicated standing water in the impoundments was treated in the on-site wastewater treatment plant.
- Groundwater monitoring was conducted for 3 years between 1981 and 1984, and no contamination was detected.[11] Eaton was relieved of groundwater monitoring requirements in 1985.[11]
- In a meeting conducted during the closure, the State of Kentucky, Eaton, and Eaton's consultant, Dames and Moore, Inc., determined that a threshhold of 2-times the background level would be used in determining whether additional soil should be removed.[8] Soil sampling was performed on three occasions, and additional material was removed after the first two sampling studies.[3] However, GCA's review of the final analytical results showed that the 2-times-background threshhold was exceeded for some of the final samples.[3] The final closure certification, which included these analytical results, was approved by the State of Kentucky.[10]

Based on discussions with plant personnel, review of files, and an inspection of the Eaton plant, it appeared that, except for the exceedences of the 2-times-background threshhold, the RCRA impoundments were closed in accordance with the approved plan. The 2-times-background level was not given in the plan but was set at a subsequent meeting.[8] The plan merely stated that the presence of contamination would be determined "by comparison with background soil quality."[5] As noted in the previous section, conflicting duplicate analyses cast doubts on some of the measured threshhold exceedences. Other exceedences were discounted by Dames and Moore based on averaging with results from other depths in the same core sample. Because the

final closure certifications were approved by the State, and because no contamination was detected in groundwater monitoring, it would appear that Eaton's backfilling the impoundment, despite the threshhold exceedences, does not constitute a violation of 40 CFR 265.

SECTION 6

REFERENCES

1. Letter from Mel Smith, Senior Project Engineer, Eaton Corporation, to Caroline Patrick Haight, Kentucky Department of Environmental Protection. Maintenance of Impoundments Prior to Closure. March 21, 1983. (Reproduced in Appendix C, Item 1.)

2. Letter from J. Alex Barber, Kentucky Department of Environmental Protection, to Mel Smith, Senior Project Engineer, Eaton Corporation. Approval of maintenance plan. March 31, 1983. (Reproduced in Appendix C, Item 2.)

3. Dames and Moore. Final Closure Certification: Wastewater Settling Ponds and Sludge Beds. Job No. 12461-007-17. October 15, 1984. (Reproduced in Appendix C, Item 8.)

4. Dames and Moore. Closure Plan: Wastewater Settling Ponds and Sludge Beds. Job No. 12461-007-17. June 11, 1984. (Reproduced in Appendix C, Item 3.)

5. Letter from Stuart Edwards, P.E., Dames and Moore, Inc., to George Gilbert, Kentucky Department of Environmental Protection. Revisions to closure plan. June 14, 1984. (Reproduced in Appendix C, Item 4.)

6. Letter from J. Alex Barber, Kentucky Department of Environmental Protection, to Mel Smith, Eaton Corporation. Approval of Closure Plan. June 20, 1984. (Reproduced in Appendix C, Item 5.)

7. Letter J. Alex Barber, Kentucky Department of Environmental Protection, to Mel Smith, Eaton Corporation. Approval of Closure Extension. October 9, 1984. (Reproduced in Appendix C, Item 6.)

8. Personal Communication with George Gilbert, Kentucky Department of Environmental Protection. Approval of threshold for contamination. August 1, 1986. (Documented in Appendix D, Item 1.)

9. Letter from H. Kitscha, Eaton, to George Gilbert, Kentucky Department of Environmental Protection. Owner Certification. October 18, 1984. (Reproduced in Appendix C, Item 7.)

10. Letter from J. Alex Barber, Kentucky Department of Environmental Protection, to H. Kitscha, Eaton Corporation. Approval of Closure Certification. December 11, 1984. (Reproduced in Appendix C, Item 9.)

11. Memo. Robert Kjilland, Geologist, Kentucky Department of Environmental Protection, to Mohammad Alauddin, Kentucky Department of Environmental Protection. Termination of groundwater monitoring requirements for Eaton. January 7, 1985. (Reproduced in Appendix C, Item 10.)

References (continued)

12. Dames and Moore. RCRA Groundwater Monitoring Semi-Annual Report - Eaton Corporation. Job No. 12461-006-21. April 3, 1984. (Reproduced in Appendix C, Item 11.)

13. Telecon. William Battye, GCA, with Stuart Edwards, P.E., Dames and Moore, Inc. Exceedences of the 2-times-background threshhold. August 20, 1986. (Reproduced in Appendix D, Item 2.)

14. Background Document - Subtitle C - Identification and Listing of Hazardous Waste. PB 81-190035, U.S. Environmental Protection Agency, Washington, D.C. May 1980. pp. 105-143.

APPENDIX A

COMPLETED INSPECTION CHECKLISTS AND OTHER INSPECTION NOTES

GCA Inspectors: [illegible]
[illegible]

Date: 7/31/86

Facility Name: [illegible]

FCID No.

Address: [illegible] KY

Tel. No.

Facility Personnel Interviewed (Name/Title/Responsibility)

[illegible] Plant Engr (retiring in one month)

David Rogers – Public Relations Dept.

Accompanied by George Gilbert

Facility Type/Size: Make switch boxes, WW [illegible] operation ([illegible]) – operated since 1965

Waste Disposed/Quantity:

Units Closed: SI's (operated '65 -> '81)

Waste Handled: [illegible]

Other Units: [illegible]

Waste Handled: [illegible]

Other Description of Closure: [illegible] SI's w/ WW treat. [illegible] $750k for closure

Clean Closure/Post Closure: [illegible]

Closure certification: Owner ✓

PE ✓

PART A Withdrawn: ✓

Deed Notation: NA

Tax Plat: NA

GW monitoring was conducted for 3 yrs from 1981 – 1984 – no contamination.

CONTAINERS/TANKS/INCINERATORS

Inventory of Equipment Remaining on Site	Contaminated?

Inventory of Equipment Removed	Where sent?

SURFACE IMPOUNDMENTS

Materials Removed/Where Sent

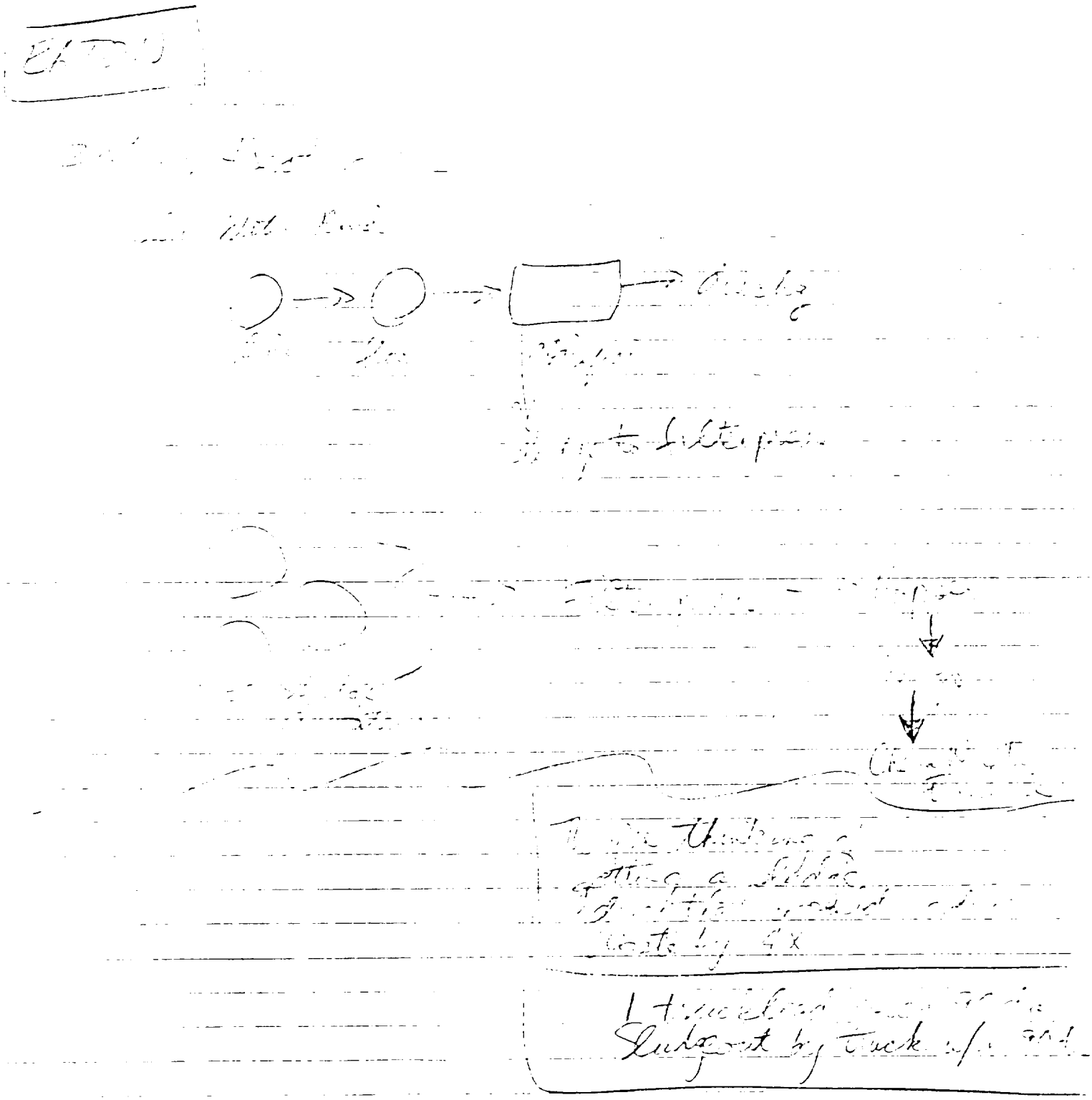
Free liquids, wastes, and residues/ WW treated on-site

Liner

Contaminated soil

Does Contaminated Material Remain On-Site? _____

(if yes, fill out landfill questionnaire)



CATC(?)

1st treat

- o They do aqueous treatment & continuous
  Also "
- o Some aqu. batch treatment

One Haz waste

Some drums of spent Varsol (Calvert City to LWD incin) / spent chlorinated degreasing solvents

Shipped out w/in 90 da

~~[illegible]~~ Eventually clean out ~~[illegible]~~ tanks for [illegible] of [illegible] may go to CWM E[illegible] to Calvert City

7/31/90

Notes of Field Visitation on
Eaton

Representatives from KY Dept. of Env. Protection:
George Kilburn - State Office
Jack Watkins - Bowling Green Office
Representatives from Facility:
Neil Smith - Plant Engineer (Hazardous Waste Management Program)
Earl Rogers - Human Relations

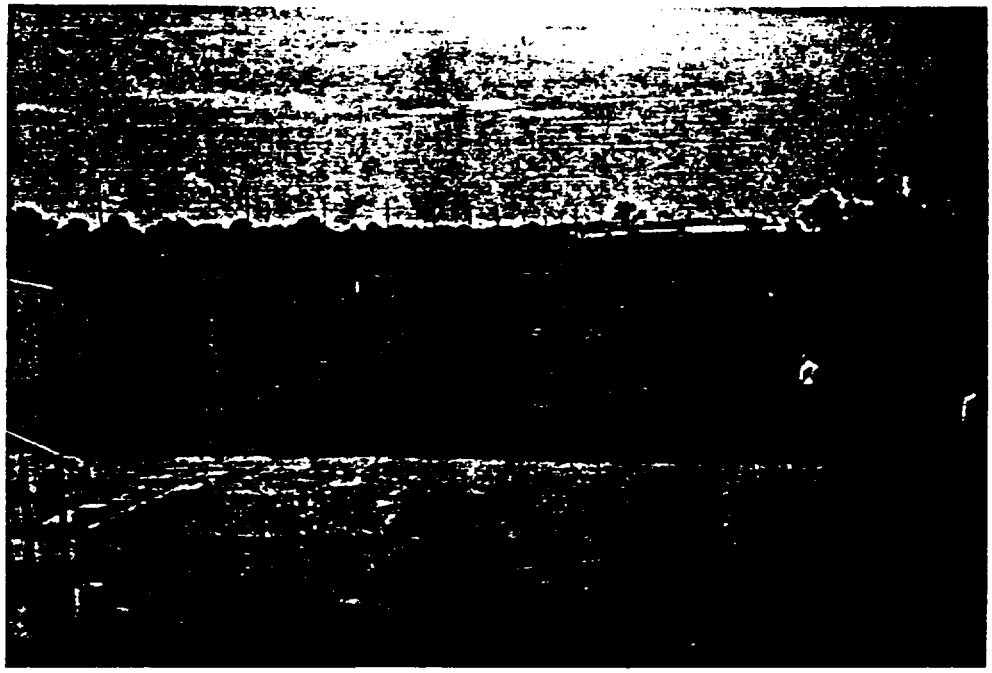
- [illegible], have painting operation, possibly plating.

In plant
- Make starters, contactors, timers, relays, etc.
- [illegible] treatment added [illegible] wastewater [illegible] sent to [illegible]
[illegible]
[illegible]
- Wastewater [illegible] from electroplating operation.
- [illegible]
[illegible]
- [illegible] 1-2 drums [illegible], H_2O/TCE, removal
drain of solvents, cleanout of sludge from trench wastes.
Solvents - LWD in Calvert City, KY for incineration.
Sludge from trench wastes - negotiating with LWD + Emelle.
- Closing cost was ~$300,000 for SI's.
- Monitored groundwater for 3 yrs starting in 1981, by Dames + Moore - no contamination shown, wells closed out.
- Contaminated soil + sludge hauled to CECOS International, Inc. in Williamsburg, OH. EPA ID # OHD 087 433 744
- Manifests: 7/11/84 - 9/28/84 356 truck loads 3.25×10^3 tons [illegible]
3.91×10^3 tons [illegible]

-

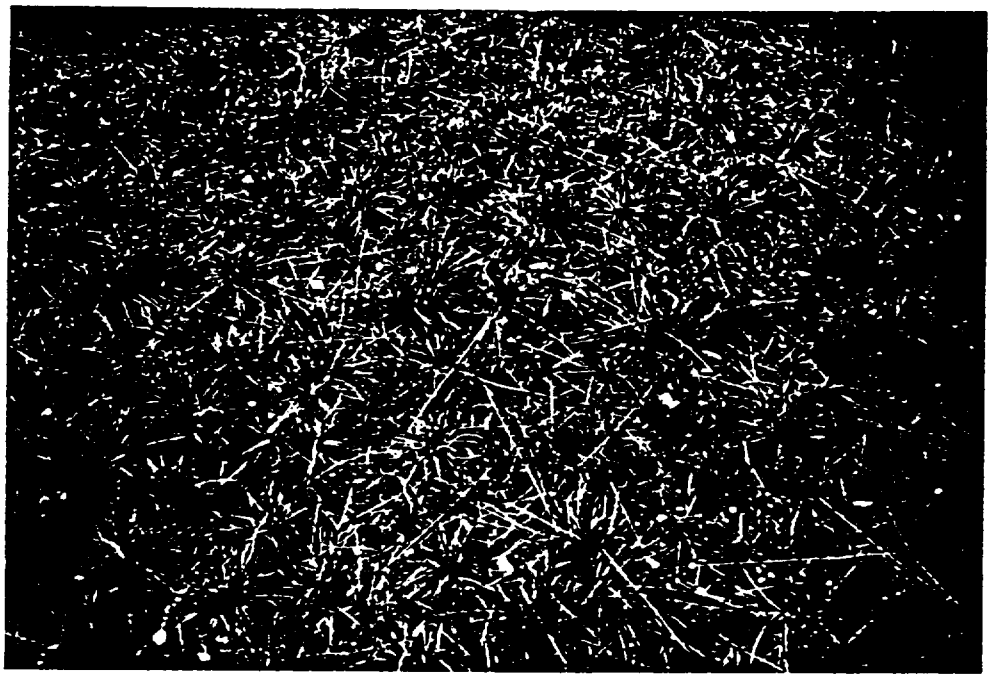
APPENDIX B

PHOTOGRAPHS



Photograph No. 1 Eaton Corp.

Former impoundment site.



Photograph No. 2 Eaton Corp.

Grass cover.

APPENDIX C

DOCUMENTS FROM FILE REVIEW

Eaton Corporation
Standard Power Control Division
Bowling Green Plant
2901 Fitzgerald Industrial Dr.
Bowling Green, KY 42101
Telephone (502) 782-1555

March 21, 1983

Mrs. Caroline Patrick Haight
Manager, Permit Review Branch
Division of Waste Management
Department For Environmental Protection
Fort Boone Plaza, 18 Reilly Road
Frankfort, KY 40601

Dear Mrs. Haight

EATON

This is in reply to your letter of March 9 and to confirm the conceptual plan proposed in your office on March 18 for dealing with our surface (storage) impoundments. They were deactivated June 15, 1981, and have received no waste since that date.

To begin with, we feel that the accumulated data is inconclusive for making a positive determination of the integrity of these impoundments. However, as noted by Mr. Dave Adams, we have reached the point at which we feel that the prudent course of action is one which will remove any doubt until such time as an approved closure plan can be implemented.

Our proposal consists of two phases as follows:

1. Provide some means to prevent further precipitation from accumulating in the impoundments.

2. Pump the liquid from each impoundment to our internal waste treatment system for processing. The filter cake developed will be disposed of in an approved, secure landfill site as is presently the case during normal operation of the system. Filtrate, in compliance with criteria established by the Bowling Green Municipal Utility, will be discharged to that facility under an agreement already negotiated.

An exact time frame is impossible to determine at this moment, but our goal is to achieve impoundment protection in ten weeks, with "pumpdown" anticipated to require at least an additional ten weeks. In other words, we expect this project to be completed sometime in August of this year. It should be noted that during this period we will have two weeks of scheduled plant shutdown. We will work closely with Mr. Bob Adams, District Supervisor, Division of Water, and with whomever you designate from your office. A more detailed timeframe will be provided as soon as it can be developed.

As you know, our current Closure Plan is based on Chemical Fixation/ Solidification (with subsequent delisting and waste remaining on-site). We were recently advised by Chemfix that after considerable evaluation they felt that their process would lead to only a marginal chance of success. This came about because of the EPA policy of applying delisting criteria above and beyond that which has been formally published. Now that your office has the sole responsibility for review of delist petitions, we will renew our investigation of the feasibility of utilizing this process.

On behalf of Eaton, I want to thank you and Mr. Art Curtis for the opportunity given us to present our proposal and to assure you that we will continue to work closely with your department in arriving at an acceptable solution to our situation.

EATON

Sincerely

Mel Smith

Mel Smith
Senior Project Engineer

vsv

pc D. Adams, Plant Manager
R. Adams, District Supervisor, D.O.W.
R. Burtt, Quality Assurance Manager
D. Curry, Branch Supervisor, D.O.W.
A. Curtis, Chief, Plans Review Section
K. Manchen, Environmental Engineer

March 31, 1983

Warren Co.

Mr. Mel Smith
Senior Project Engineer
Eaton Corporation
Standard Power Control Division
2901 Fitzgerald Road
Bowling Green, Kentucky 42101

Dear Mr. Smith:

The Division of Waste Management approves of the conceptual plan outlined in your letter of March 21, 1983, for dealing with the surface impoundments at your site.

Your interim status hazardous waste facility closure plan should be revised to reflect the conceptual plan and be resubmitted for review. If a delist petition is to be pursued, the sampling plan should be included in the final closure plan. If approved, the Division of Waste Management field respresentative will split samples at your site on the date of sampling. A delist petition would be prepared strictly following the requirements of 40 CFR 260.22 (which is filed in 401 KAR 31:040 Section 1(2) by reference). Other than the sampling plan, no additional unpublished requirements exist for delist petitions which are processed by the Commonwealth of Kentucky.

If you have any questions on interim status hazardous waste facility closure plans or delist petitions, please contact Mr. George F. Gilbert, Jr., P.E., of this office at (502) 564-6716, Ext. 237.

Sincerely,

J. Alex Barber

J. Alex Barber, Director
Division of Waste Management

JAB:GFG:cg

cc: Don Curry, Area Supervisor

CLOSURE PLAN
WASTEWATER SETTLING PONDS AND SLUDGE BEDS
EATON CORPORATION
INDUSTRIAL CONTROL DIVISION
BOWLING GREEN, KENTUCKY

JOB NO. 12461-007-17
JUNE 11, 1984

Dames & Moore

TABLE OF CONTENTS

I hereby certify that this plan for the closure of the settling ponds and sludge beds at Eaton Corporation, Industrial Control Division's Bowling Green, Kentucky plant was prepared under by direct supervision.

Stuart Edwards
Registered Professional Engineer
No. 13439

SITE DESCRIPTION

Eaton Corporation's Industrial Control Division facility is located approximately 1 mile south of Bowling Green in the Mississippian Plateau area of Kentucky. This area is a slightly rolling karst plain characterized by few streams and numerous sinkholes.

The ground surface in the wastewater treatment area is essentially level due to grading during plant construction when up to 7 feet of fill was placed to bring the ground elevation to approximately 37 feet (plant datum). The impoundments were then constructed within the fill and the upper few feet of natural soils. North of the impoundment dikes, the ground surface slopes to a lake on the plant property.

The soils overlying bedrock at this site consist of up to 7 feet of clay fill, and original surficial clay soils up to 7 feet thick. The underlying bedrock consists of the Ste. Genevieve Limestone of Upper Mississippian age. The limestone is light gray and contains numerous voids and fractures. This limestone is the uppermost water-bearing zone at the site where ground water occurs within the fractures and voids.

Natural shallow ground water in the vicinity of the wastewater treatment facilities is generally suitable for use as a water supply. The ground water sampling program has shown that there is no evidence of the hazardous waste constituents (nickel or cyanide) in the ground water (Appendix B, RCRA Ground Water Monitoring Semi-Annual Report).

FACILITY CHARACTERISTICS

The impoundments consist of two settling ponds where relatively clean water--possibly containing some precipitated metals--was discharged to one of the ponds so that the precipitated material could settle. The ponds served as clarifiers.

This system also provided two sludge beds to which the sludges generated in the batch treatments, and those drawn from the bottom of the closed loop reservoirs were directed for settling and thickening. The

INTRODUCTION

The water treatment system at the Eaton Corporation, Industrial Control Division facility in Bowling Green, Kentucky includes four wastewater treatment impoundments which are considered as hazardous waste facilities under the 1976 Resource Conservation and Recovery Act (RCRA). These are presently regulated under Interim Status by the Kentucky Administrative Regulations, 401 KAR 35 standards.

A Phase II waste treatment system was brought "on-line" on June 15, 1981 (negating the further need for surface impoundments), and no additional wastes have been placed in the impoundments since that date. This new system resulted in:

1. A considerable amount of reuse water
2. Discharge to the POTW of filtrate (which is monitored by the POTW and Eaton) under a permit with them
3. The production of filter cake with disposal in a secure site in accordance with all applicable Kentucky DNR regulations

This plan is designed to permit closure under the Interim Status standards and, as such, remove the facility from further regulation as a hazardous waste management facility. Closure is to be accomplished by removing all the impounded materials and contaminated soils as per 401 KAR 35:200(6) (Closure and Post-Closure Surface Impoundments). Site closure to meet these requirements involves the following general components:

- Pumping of free liquids, if any
- Cleaning out of accumulated sludges
- Removal of contaminated soil, if any
- Site grading compatible with future anticipated land use

overflow from the sludge beds was directed to the settling ponds before discharge.

The two settling ponds are essentially rectangular, approximately 142 feet long and 82 feet wide (Plate 1). Plot plans of the area from Eaton records show the ponds to be surrounded by a perimeter dike, the top elevation of which is 37 feet plant datum. Side slopes are 1V (vertical):3H (horizontal) on both the interior and exterior sides. The area between the two ponds is essentially flat, with an elevation of approximately 37 feet plant datum and separates the ponds by about 10 feet. Original construction drawings (Eaton Drawing CG-4) for the ponds show that the bottom elevations were designed to be 30 feet plant datum. The impoundments were constructed with a 12-inch compacted clay liner overlying a 4-mil PVC artificial liner. The entire hazardous waste facility is presently covered by an air support structure to prevent water accumulation in the impoundments which have been pumped of standing water.

A pipe system extending from the plant supplied effluent to both ponds. Discharge of effluent into each pond was accomplished through lateral piping off the distribution box. Effluent flowed through the basins, and treated water was then discharged through the distribution box into a 6-inch steel galvinized corrugated pipe to the lake under a permit issued by the Division of Water Quality. General characteristics of the ponds are shown on Plate 1. Sludge contained in the two ponds is estimated at the following volumes:

East pond	583 cubic yards
West pond	990 cubic yards
	1,573

The sludge beds consist of two essentially rectangular areas. Each bed measures 80 feet in length and 65 feet in width with 1V:3H interior and exterior slopes. The crest of the perimeter dike is at an elevation of 37 feet plant datum, and the beds are separated by a 10-foot-wide center dike. Sludge estimates indicate that the beds contain the following volumes:

North beds	288 cubic yards
South beds	288 cubic yards
	576

The chemical characteristics of the sludge have been evaluated (laboratory analysis provided by Eaton, see Appendix C), indicating the following total metallic concentrations based upon sampling performed on May 11, 1981:

	Concentration (ppm)	
	Composite 1[1]	Composite 2[2]
Cadmium	210	210
Chromium (total)	750	725
Copper	625	675
Nickel	840	880
Lead	37.5	37.5
Zinc	2,500	4,750
Silver	0.55	0.57
Tin	150	140
Barium	110	135

EP toxicity results on the sludge from the same event were:

	Concentration (ppm)	
	Composite 1[1]	Composite 2[2]
Barium	7.0	9.0
Cadmium	3.2	7.5
Chromium	0.45	0.45
Arsenic	0.025	0.040
Tin	<0.005	<0.005
Lead	<0.5	<0.5
Mercury	0.0011	<0.0002
Silver	0.12	0.10

Physical tests by CECOS in May 1984 indicate that the sludge, prior to any dewatering efforts, has a unit weight of 64.3 to 66.1 pounds per cubic foot.

CLOSURE PLAN

Closure of the wastewater treatment ponds and sludge beds will be conducted by CECOS Environmental employing sludge-handling methods and procedures to provide the maximum safety to onsite personnel, while maintaining total compliance with local, state, and federal regulations. This is done by using trained professionals equipped with proper safety equipment.

[1] Composite from north sludge bed. C-10
[2] Composite from south sludge bed.

Closure of the basins will consist of:

1. The air support structure will be removed. Plastic sheeting will be placed over the impoundments to prevent contamination during removal. The sheeting will then be disposed of in the offsite hazardous waste landfill.

2. Influent piping from the plant to both the sludge beds and settling ponds will be flushed from the building with high caustic-content soap and water to emulsify any sediment, followed by a water rinse. All rinse-out liquids will be directed to the plant treatment system. The piping will then be plugged at both the plant end and near the distribution boxes.

3. The sludge will be stabilized by solidifying with lime kiln flue dust.[3] Estimated volumes and weight for the four beds is:

   A. North and South Sludge Beds

Estimated total volume	576 cubic yards
Estimated bulk density	1,735 pounds/cubic yard
Total weight	499.7 tons
Pozzalime requirements	150 tons (30 percent wt/wt)
Total weight for disposal	649.7 tons

   B. West Settling Pond

Estimated total volume	990 cubic yards
Estimated bulk density	1,785 pounds/cubic yard
Total weight	883.6 tons
Pozzalime requirements	220 tons (25 percent wt/wt)
Total weight for disposal	1,103.6 tons

   C. East Settling Pond

Estimated total volume	583 cubic yards
Estimated bulk density	1,825 pounds/cubic yard
Total weight	541.1 tons
Pozzalime requirements	90 tons (17 percent wt/wt)
Total weight for disposal	631.1 tons

   D. Clay Liner

Estimated total volume	1,248 cubic yards
Estimated bulk density	2,500 pounds/cubic yard
Total weight for disposal	1,560 tons

The stabilized sludge, 12-inch compacted clay liner, and artificial liner will be removed to the CECOS approved hazardous waste landfill for disposal. As a generator of hazardous waste, all

[3] Lime kiln flue dust is marketed under the trade name Pozzalime by Mineral By-Products, Inc., 8070 Condor Court, Centerville, OH 45459 (513) 435-3194.

applicable requirements of 40 CFR 262, 263, and 265 will be observed. These requirements cover manifesting the material to be transported and reporting protocols.

The following materials, equipment, and manpower will be used for the sludge solidification, excavation, transportation, and disposal:

A. Equipment van
B. Chemical technician
C. Backhoe with operator
D. Loader with operator
E. Personal safety equipment
F. All materials required for construction of the truck cleaning station
G. High-pressure spray cleaner
H. High calcium oxide pozzalime

CECOS Environmental shall also supply the required bulk trailers for transport of the solidified material.

A truck and equipment cleaning station will be constructed onsite the first working day for removal of any exterior contamination on all vehicles leaving the project area. This station will be a double-lined gravel pit 60 feet by 10 feet by 6 to 8 inches deep. All wash fluids will be collected as they accumulate and pumped to the impoundment area or to wastewater treatment facilities as directed by Eaton. After project completion, this wash station will be removed and disposed of as hazardous at CECOS Secure Chemical Management Facility.

Both the backhoe and loader will be utilized the first and second working day to accumulate an inventory of solidified material (no free liquid, no slump) and all visually detectable contaminated soil.

Solidification will begin in either the north or south sludge bed. Solidification and excavation procedures will be comparable at all four impoundment areas regardless of the starting point.

Loading of bulk trailers will commence the third working day between 8:00 a.m. and 2:45 p.m. The loader will be utilized primarily for this function, with the backhoe solidifying and providing stockpiled material for loading.

Stockpiled material will be allowed to cure for approximately 48 hours prior to loading. Utilizing this approach provides the most efficient use of solidification agent.

All sludge materials and clay liner will be removed in 8 days after the 2 days of solidifying and stockpiling. To accomplish this, CECOS Environmental will be removing approximately 24 trucks per day.

4. At the completion of excavation of all the contained sludge, clay, and artificial liner in each impoundment area, CECOS Environmental shall grid each impoundment at 30-foot intervals resulting in four samples from within both the south and north sludge beds and eight from within the west and east settling ponds. Each sample will consist of 2-foot-deep plug samples, extracted, and isolation of samples at the surface and 6-inch intervals. All samples will be properly containerized and logged per chain-of-custody requirements for shipment to CECOS Environmental's subcontracted laboratory in Dayton, Ohio.

   The following methodology will be used for analysis of samples:

   A. Surface samples: analysis of all samples for EP toxicity and cyanide

   B. Each 6-inch sample, as required: analysis of samples for parameters above RCRA limits as determined by analysis of the surface samples

   If the results indicate that mobile contaminants have penetrated below the impoundment bottom, excavation will be conducted to ensure removal of contaminated soil.[4] The backhoe and loader will be utilized to remove 6-inch "lifts" as required, excavating and loading approximately 26 truckloads per day. As such, each 6-inch lift can be removed in 1-1/2 working days.

5. All influent and effluent distribution boxes will be treated as hazardous and removed to the landfill. The 6-inch effluent pipe will be removed, crushed, and used as fill in the final grading.

6. Final grading will consist of returning the site to approximate original contour as shown on Plate 1, followed by revegetation.

7. The ground water monitoring system will be removed, and the wells plugged with concrete after final certification and approval.

8. All equipment used in removal of contaminated soil and filter material (backhoe) will be steam-cleaned at the site, with the water being directed to the waste treatment facility.

GROUND WATER MONITORING

Ground water monitoring will be continued during the closure period in accordance with the sampling and analysis plan (Appendix A, Ground Water

[4] Contaminated soil is defined as soil that is classified as hazardous using the EP toxicity test.

Sampling and Analysis Plan) if closure has not been completed and certification approved prior to the semi-annual sampling event scheduled for August 1984.

Monitoring wells will be maintained during closure activities, and any refitting necessary due to regrading will be performed to ensure ground water monitoring capabilities. Following certification and final approval by the Department of Natural Resources and Environmental Protection, all monitoring wells will be plugged and surface expression removed.

CLOSURE CERTIFICATION

Closure certification will be provided by Eaton Corporation and by an independent professional engineer (Dames & Moore, Cincinnati, Ohio) upon completion. These certifications are to ensure that closure is done in accordance with the approved closure plans. To enable the independent engineer to certify the closure, periodic field observation will be required during key closure activities.

SCHEDULE

Closure will commence upon Department of Natural Resources final approval of this closure plan, with completion within 14 working days of stabilization and removal.

#84-[illegible]

(40)

Dames & Moore

644 Linn Street
Suite 501
Cincinnati, Ohio 45203
(513) 651-3440

June 14, 1984

Mr. George Gilbert
Natural Resources and Environmental Protection Cabinet
Department for Environmental Protection
Division of Waste Management
Fort Boone Plaza
18 Reilly Road
Frankfort, KY 40601

Dear George:

Closure Plan Revision
Wastewater Settling Ponds and Sludge Beds
Eaton Corporation
Industrial Control Division
Bowling Green, Kentucky

In regards to a telephone conversation of June 14, 1984 between Mr. George Gilbert, Kentucky Division of Waste Management, and Mr. Steve Lamb of Dames & Moore regarding revisions to the Easton Wastewater Settling Pond and Sludge Beds closure plan, we are submitting this letter as the revisions to the closure plan.

The necessary revisions concern the handling of wastewater and the soil sampling program for closure certification.

1. All wash fluids collected from truck and equipment cleaning will be directed to the Eaton wastewater treatment facility.

2. Background soil samples will be obtained and analyzed for cadmium, hexavalent chromium, nickel, and cyanide (free) (40 CFR 261 Appendix VIII, F006). Six samples will be obtained for compositing. Each sample will be collected from a minimum depth of 12 inches to ensure collection (below the topsoil) and composited for analysis. Proposed collection points are indicated on Figure 1.

   At the completion of excavation of all the contained sludge, clay, and artificial liner in each impoundment area, CECOS Environmental shall grid each impoundment at 30-foot intervals resulting in four samples from within both the south and north sludge beds and eight from within the west and east settling ponds. Each sample will consist of 2-foot-deep plug samples, extracted, and isolation of samples at the surface and 6-inch intervals. All samples will be properly containerized and logged per chain-of-custody requirements for shipment to CECOS Environmental's subcontracted laboratory in Dayton, Ohio.

PUBLIC NOTICE

Eaton Corporation of 2901 Industrial Drive, Bowling Green, Kentucky 42101, has submitted a plan to Kentucky Natural Resources and Environmental Protection Cabinet to close an existing hazardous waste facility located at the plant. The manufacturing plan itself will remain open and continue to conduct normal operations. More additional information concerning environmental safeguards are contained in Eaton's hazardous waste facility closure plan on file with the Division of Waste Management in Frankfort.

The hazardous waste facility to be closed is a surface impoundment which has held wastewater treatment sludges from electroplating operations, EPA Waste Number F006. Eaton formerly used the four basins as a part of the NPDES permitted wastewater treatment process. On June 15, 1982, Eaton began using a more technically advanced "Phase II" wastewater treatment plant which discharges to the local sanitary sewer. No need for the ponds now exist.

Eaton is draining all free liquids from the impoundments to the wastewater treatment unit. CECOS, a licensed contractor, will treat and remove all electroplating sludge to an out-of-state permitted landfill. All soil contaminated above background levels will also be removed to the same landfill.

No wastes from outside the plant has ever been accepted at the facility.

Any person who may be aggrieved by the closing of this existing hazardous waste facility may file with the Cabinet written comments setting forth the grounds of the objection as allowed by 401 KAR 35:070 Section 3(4) identical to 40 CFR 265.112(d)) or a petition stating the objection and demand a hearing pursuant to KRS 224.081(2). The written comments or petition may be sent to: Director, Division of Waste Management, 18 Reilly Road, Frankfort, Kentucky 40601.

October 9, 1984

Mr. M.H. Smith
Sr. Project Engineer
Eaton Corporation
2901 Fitzgerald Industrial Drive
Bowling Green, Ky. 42101

RE: Application #84-141, Actual Closure Plan for Hazardous Waste Facility EPA I.D. #KYD09-895-0306

Dear Mr. Smith:

The Division of Waste Management approves the extension of time to complete closure as requested by your letter of September 18, 1984. Decontamination of soil underlying the lagoons and certification by an independent Professional Engineer must be completed by October 19, 1984. The approval of the additional time is consistent with 401 KAR 35:070 Section 4 since all of the sludges were removed within ninety days and total time to close will be less than 180 days (reference: telephone conversation between Mr. Mel Smith and Mr. George Gilbert of October 5, 1984).

As stated in your letter, Eaton Corporation is relieved of complying with Part B submittal requirements.

If you have any questions, please contact Mr. George Gilbert, P.E., at (502) 564-6716, Ext. 237.

Sincerely,

J. Alex Barber, Director
Division of Waste Management

JAB:GFG:cg

cc: Don Curry, Area Supervisor

Vice Presid

Eaton Corporation
Industrial Control and
Power Distribution Operations
4201 North 27th Street
Milwaukee, Wisconsin 53216
Telephone (414) 449-6091

RECEIVED

OCT 2 2 1984

DIVISION OF
WASTE MANAGEMENT

October 18, 1984

Mr. George Gilbert, P.E.
Division of Waste Management
18 Reilly Road
Fort Boone Plaza
Frankfort, KY 40601

Dear Mr. Gilbert:

This is to certify that the Surface Impoundment Storage Facility located at our Eaton Plant in Bowling Green, Kentucky, has been closed in accordance with the specifications in the approved closure plan.

Sincerely,

H. Kitscha
Vice President
Industrial Control and
Power Distribution Operations

HK/kr

cc: D. M. Adams
R. A. Burtt
M. H. Smith
D. F. Engstrom

FINAL CLOSURE CERTIFICATION
WASTE WATER SETTLING PONDS
AND SLUDGE BEDS

EATON CORPORATION
INDUSTRIAL CONTROL DIVISION
BOWLING GREEN, KENTUCKY

DAMES & MOORE
OCTOBER 15, 1984

Dames & Moore

Dames & Moore
644 Linn Street
Suite 501
Cincinnati, Ohio 45203
(513) 651-3440

October 15, 1984

Eaton Corporation
Standard Power Control Division
Bowling Green Plant
2901 Fitzgerald Drive
Bowling Green, Kentucky 42101

Attention: Mr. Mel Smith

Re: Final Closure Certification
Waste Water Settling Ponds
and Sludge Beds

Eaton Corporation
Industrial Control Division
Bowling Green, Kentucky

Dear Mel:

This letter serves as Dames & Moore's Final Certification of Closure of Eaton Corporation's Bowling Green, Kentucky waste water settling ponds and sludge beds as required by 401 KAR 35 and as detailed in the Closure Plan dated June 11, 1984 and the Closure Plan Revision dated June 14, 1984.

As required in the Closure Plan Revision, the following summary is provided:

1. The amount of free liquid present in the surface impoundments prior to closure and the dates removed are shown on Table 1. All supernatant was pumped to the Eaton internal waste treatment plant, treated, and discharged to the Public Owned Treatment Work (POTW). This was performed under a prior agreement with the POTW.

2. The amount of decontamination liquid and accumulated precipitation during closure is shown on Table 2. This liquid was also pumped to the internal treatment facility, treated, and discharged to the POTW.

3. The amount of contaminated sludge and soil including the clay liner and all underlying contaminated soil disposed offsite is shown on Table 3.

The attached certification is provided as required to certify that closure has been done to the best of our knowledge in accordance with the approved closure plan and that all contaminated material has been removed and disposed of in an accepted hazardous waste landfill.

Underlying contaminated soil was identified by a comparison of chemical analyses of the underlying soil with background levels. Background levels for cadmium, hexavalent chromium, free cyanide and nickel were determined by compositing six samples obtained at the locations shown on Figure 1. At the completion of the excavation of all the sludge, and both the clay and artificial liner, a grid was laid out in each impoundment for collection of soil samples. Each sample consisted of 18-24 inches of soil with analyses performed at every 6 inch interval. These sampling locations are also shown on Figure 1. The background levels were determined to be as follows:

Cadmium	3.250 mg/Kg
Cyanide (free)	0.232 mg/Kg
Chromium (hexavalent)	<0.159 mg/Kg
Nickel	29.800 mg/Kg

The levels of the hazardous constituents determined in the underlying soil were compared to the background values in order to determine whether the hazardous constituents had migrated from the impoundments. This comparison was conducted by using two times the background mean as an indicator of contaminated soil. Twice the mean was utilized as an appropriate indicator of contamination based on the definition of the backgroumd composite as being a mean value in the area and to allow for laboratory variability in analyses.

Closure, including sludge stabilization and removal and removal of the clay and artificial liner, was accomplished from July 11 to August 3, 1984 after which time soil sampling was conducted. An analysis of the results collected during this investigation revealed several areas where contaminated soil was encountered (North sludge bed - all sampling locations, West settling pond - Locations 1, 3 and 7, South sludge bed - Location 4).

On August 27 and 28, 1984, additional soil was excavated from the above locations to the depths required to remove the contaminated soil. An additional 14 inches was removed from the north sludge bed and an additional 6 inches was removed from the above identified areas in the west pond and the south sludge bed. The areas for excavation were determined by bisecting the distance to each sampling point with its nearest neighbor and included an equivalent thickness from the side slopes. Additional soil samples were obtained from 0-6 inches for verification that all contaminated material had been removed.

An analysis of these results indicated that not all of the contaminated soil had been excavated. On September 11, 1984, sampling was again conducted to a total depth of 24 inches at each sampling location still indicating contamination (the north sludge bed and Location 4 in the south sludge bed) to provide an indication of the depth required for further excavation. On September 27 and 28, 1984, additional soil was excavated for disposal and a final soil sampling was conducted to a total depth of 24 inches. Excavation was conducted to the following depths utilizing the nearest neighbor bisection procedure:

North Pond - Location 1 - 8 inches
Location 2 - 10 inches
Location 3 - 20 inches
Location 4 - 24 inches

South Pond - Location 4 - 16 inches

Analytical results of this final soil sampling indicated that all underlying contaminated soil had been removed. The complete chemical data is shown on Tables 4 through 27 and the volumes of soil excavated are shown on Table 3.

* * *

We have enjoyed working with you on this project and look forward to assisting you in the future. If you have any questions regarding the included information or concerning this certification, please do not hesitate to call.

Yours truly,

DAMES & MOORE

Stuart Edwards, P.E.
Associate

SE:kjg

Attachments

I, Stuart Edwards , a Registered Professional Engineer, hereby certify that visual inspections of closure activities at the Waste Water Settling Ponds and Sludge Beds, Eaton Corporation, Bowling Green, Kentucky have been performed under my direct supervision and that, to the best of my knowledge and belief, closure has been performed in accordance with the closure plan for the facility approved by the Natural Resources and Environmental Protection Cabinet, Department for Environmental Protection, of the Commonwealth of Kentucky.

Signature

October 15, 1984
Date

13439
Kentucky Professional Engineer License Number

644 Linn Street
Address
Suite 501

Cincinnati, Ohio 45203

(513) 651-3440
Phone

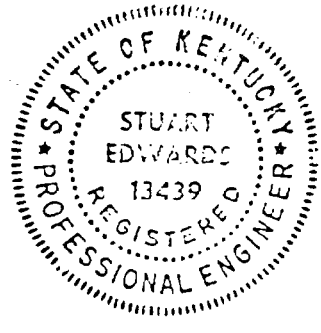


TABLE 1
SURFACE IMPOUNDMENTS - PUMPING SUMMARY[a]

DATE	SOUTH SLUDGE BED	NORTH SLUDGE BED	WEST SETTLING POND	EAST SETTLING POND
7/29/83	Alpha Air Building Inflated			
8/30/83			7160	
8/31/83			7050	
9/1/83				7380
9/8/83				6450
9/15/83				7790
10/14/83			2900	
12/10/83			13430	
2/8/84				4960
2/18/84			7640	
2/20/84		9000		
2/21/84	4000	5000		
2/23/84	3000			
3/3/84	600	600	700	600
3/13/84			2500	
3/17/84			2500	
3/21/84		2500		
4/26/84	800	800	900	
6/25/84	Alpha Air Building Removed			
7/8/84			3000	
TOTAL	8400	17900	47780	27180

[a]All of the above data is in gallons.

TABLE 2

LIQUIDS DISPOSED DURING CLOSURE[a]

DATE	SOUTH SLUDGE BED	NORTH SLUDGE BED	WEST SETTLING POND	EAST SETTLING POND	TRUCK DECONTAMINATION STATION
7/9/84	Cecos Project Initiated			3000	
7/11/84	2300	2200			
7/16/84	2000		3000		1000
7/17/84				500	1000
7/19/84		2750		250	
7/21/84		3000			
7/25/84		1500			
7/30/84	350				
8/28/84					3000
8/29/84	3000				
8/30/84	3300				
9/26/84	1000	1000			1000
TOTAL	11950	10450	3000	3750	6000

[a]All of the above data is in gallons.

TABLE 3

SM30216 - MANIFEST SUMMARY

DATE	SLUDGE (lbs)	CLAY LINER (lbs)
7/11/84	416860	
7/12/84	411380	
7/16/84	290700	
7/17/84	829680	
7/18/84	461886	
7/19/84	123780	853760
7/20/84	173350	454560
7/23/84	385600	645280
7/24/84	872620	671400
7/25/84	407620	465200
7/26/84	329980	
7/27/84	790840	
7/30/84	84040	914960
7/31/84	514000	317820
8/1/84	248060	366520
8/2/84	167840	625400
8/3/84		219160
8/27/84		738280
8/28/84		217020
8/29/84		432700
8/30/84		198420
9/27/84		251220
9/28/84		129180
10/11/84		320000
SUBTOTAL	6508236	7820880
	3254 tons	3910 tons
TOTAL		7164 tons

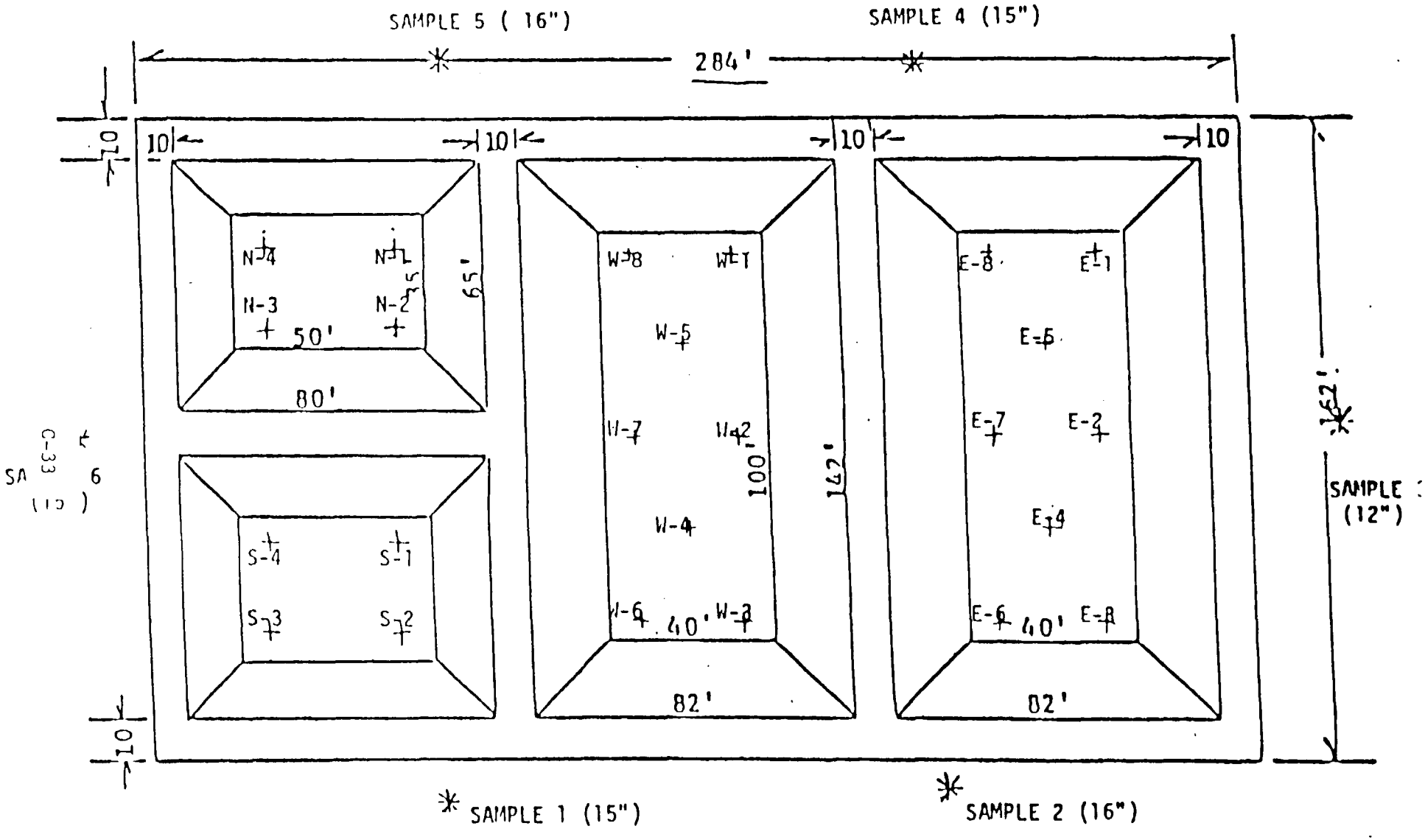


FIGURE 1 SOIL SAMPLING LOCATIONS
SCALE 1" approximately 36'

TABLE 4. EATON SOIL SAMPLE ANALYSES - NORTH POND, LOCATION ONE

			PARAMETER (mg/Kg dry weight)			
DATE	DATE	SAMPLE DEPTH (INCHES)	CADMIUM	HEXAVALENT CHROMIUM	FREE CYANIDE	NICKEL
7-30-84	7-30-84	0-6	<0.367	<0.144	0.600	32.800
		6-8	<0.332	<0.165	<0.232	28.600
		11-13	0.646	<0.122	<0.232	27.300
		16-18	0.612	<0.144	<0.232	21.700
		22-24	1.780	<0.124	0.651	50.800
8-27-84	8-27-84	0-6	0.365	<0.086	1.170	61.800
9-11-84	9-11-84	0-6	0.350	<0.162	1.480	36.435
		6-8	0.440	<0.162	<0.232	43.090
		11-13	0.585	<0.162	<0.232	42.180
		16-18	0.780	<0.162	<0.232	72.070
9-27-84	9-27-84	0-6 (A)	4.230	<0.159	<0.232	57.900
		0-6 (B)	1.970	<0.159	<0.232	79.600

TABLE 5. EATON SOIL SAMPLE ANALYSES - NORTH POND, LOCATION TWO

			PARAMETER (mg/Kg dry weight)			
DATE	DATE	SAMPLE DEPTH (INCHES)	CADMIUM	HEXAVALENT CHROMIUM	FREE CYANIDE	NICKEL
7-30-84	7-30-84	0-6	75.500	<0.131	<0.232	210.000
		6-8	<0.343	<0.158	1.000	21.300
		11-13	0.744	<0.108	<0.232	26.300
		16-18	0.740	<0.081	<0.188	24.900
8-27-84	8-27-84	0-6	1.680	<0.093	1.890	57.600
9-11-84	9-11-84	0-6	0.335	<0.162	1.960	28.250
		6-8	0.335	<0.162	1.430	43.090
		11-13	0.615	<0.162	<0.232	26.410
		16-18	0.765	<0.162	<0.232	33.340
9-27-84	9-27-84	0-6	2.070	<0.159	<0.232	53.600

TABLE 6. EATON SOIL SAMPLE ANALYSES - NORTH POND, LOCATION THREE

			PARAMETER (mg/Kg dry weight)			
DATE	DATE	SAMPLE DEPTH (INCHES)	CADMIUM	HEXAVALENT CHROMIUM	FREE CYANIDE	NICKEL
7-30-84	7-30-84	0-6	0.826	<0.119	55.000	36.200
		6-8	0.483	<0.127	26.000	24.700
		11-13	0.322	<0.083	15.700	37.400
		16-18	2.150	<0.084	<0.232	53.400
		22-24	1.050	<0.088	0.370	51.800
8-27-84	8-27-84	0-6	0.700	<0.098	4.110	48.100
9-11-84	9-11-84	0-6	0.340	<0.162	4.210	39.500
		6-8	0.295	<0.162	2.520	34.370
		11-13	0.325	<0.162	1.470	31.390
		16-18	0.390	<0.162	0.800	38.530
		22-24	0.405	<0.162	<0.232	26.000
9-27-84	9-27-84	0-6	1.610	<0.159	<0.232	45.800

TABLE 7. EATON SOIL SAMPLE ANALYSES - NORTH POND, LOCATION FOUR

			PARAMETER (mg/Kg dry weight)			
DATE	DATE	SAMPLE DEPTH (INCHES)	CADMIUM	HEXAVALENT CHROMIUM	FREE CYANIDE	NICKEL
7-30-84	7-30-84	0-6	0.662	0.157	32.300	30.000
		6-8	<0.342	<0.119	5.000	24.300
		11-13	0.371	<0.098	<0.232	24.900
		16-18	1.410	<0.081	1.150	24.000
8-27-84	8-27-84	0-6	1.630	<0.106	23.700	48.600
		0-6 (DUP)	1.240	---	---	41.240
9-11-84	9-11-84	0-6	0.415	<0.162	7.700	43.200
		6-8	0.480	<0.162	12.300	36.310
		11-13	0.385	<0.162	4.670	37.140
		16-18	0.450	<0.162	9.470	35.340
		22-24	0.930	<0.162	5.880	24.290
9-27-84	9-27-84	0-6	1.520	<0.159	<0.232	42.500
		6-8	1.620	<0.159	<0.232	32.600
		11-13	1.720	<0.159	<0.232	29.600
		16-18	1.730	<0.159	<0.232	31.200
		22-24	2.120	<0.159	<0.232	25.400

TABLE 8. EATON SOIL SAMPLE ANALYSES - SOUTH POND, LOCATION ONE

		PARAMETER (mg/Kg dry weight)			
DATE	SAMPLE DEPTH (INCHES)	CADMIUM	HEXAVALENT CHROMIUM	FREE CYANIDE	NICKEL
7-30-84	0-6	5.070	<0.140	0.029	34.200
	6-8	0.793	0.322	0.039	30.600
	11-13	0.525	<0.117	<0.156	36.700
	16-18	1.470	<0.108	<0.093	43.300
	22-24	1.330	<0.094	<0.083	41.800
9-11-84	0-6	0.650	<0.162	2.600	38.720
	6-8	0.240	<0.162	1.880	23.980
	11-13	0.225	<0.162	2.720	30.600
	16-18	0.265	<0.162	<0.232	35.930

TABLE 9. EATON SOIL SAMPLE ANALYSES - SOUTH POND, LOCATION TWO

		PARAMETER (mg/Kg dry weight)			
DATE	SAMPLE DEPTH (INCHES)	CADMIUM	HEXAVALENT CHROMIUM	FREE CYANIDE	NICKEL
7-30-84	0-6	0.638	<0.122	0.570	51.800
	6-8	1.020	<0.127	0.128	46.900
	11-13	0.909	<0.137	<0.218	39.700
	16-18	2.180	<0.104	<0.101	70.700

TABLE 10. EATON SOIL SAMPLE ANALYSES - SOUTH POND, LOCATION THREE

		PARAMETER (mg/Kg dry weight)			
DATE	SAMPLE DEPTH (INCHES)	CADMIUM	HEXAVALENT CHROMIUM	FREE CYANIDE	NICKEL
7-30-84	0-6	2.670	<0.146	<0.232	38.200
	6-8	4.450	<0.140	<0.232	53.400
	11-13	0.918	<0.134	0.377	61.500
	16-18	1.810	<0.138	0.128	56.900

TABLE 11. EATON SOIL SAMPLE ANALYSES - SOUTH POND, LOCATION FOUR

		PARAMETER (mg/Kg dry weight)			
DATE	SAMPLE DEPTH (INCHES)	CADMIUM	HEXAVALENT CHROMIUM	FREE CYANIDE	NICKEL
7-30-84	0-6	11.500	<0.085	<0.232	178.000
	6-8	0.524	<0.082	0.476	29.000
	11-13	<0.451	<0.120	1.100	39.700
	16-18	0.727	<0.109	<0.097	52.600
	22-24	0.748	<0.091	<0.101	40.500
8-30-84	0-6	2.570	<0.089	2.850	48.500
[illegible]-27-84	0-6	0.496	<0.159	<0.232	68.500

TABLE 12. EATON SOIL SAMPLE ANALYSES - EAST POND, LOCATION ONE

		PARAMETER (mg/Kg dry weight)			
DATE	SAMPLE DEPTH (INCHES)	CADMIUM	HEXAVALENT CHROMIUM	FREE CYANIDE	NICKEL
7-26-84	0-6	1.360	<0.105	0.130	22.500
	6-8	1.880	<0.144	<0.171	26.300

TABLE 13. EATON SOIL SAMPLE ANALYSES - EAST POND, LOCATION TWO

		PARAMETER (mg/Kg dry weight)			
DATE	SAMPLE DEPTH (INCHES)	CADMIUM	HEXAVALENT CHROMIUM	FREE CYANIDE	NICKEL
7-26-84	0-6	0.735	<0.131	<0.150	28.400
	6-8	<0.370	<0.119	<0.209	35.100
	11-13	<0.361	<0.093	<0.162	28.200
	16-18	0.433	<0.079	<0.075	18.100

TABLE 14. EATON SOIL SAMPLE ANALYSES - EAST POND, LOCATION THREE

DATE	SAMPLE DEPTH (INCHES)	PARAMETER (mg/Kg dry weight) CADMIUM	HEXAVALENT CHROMIUM	FREE CYANIDE	NICKEL
7-26-84	0-6	<0.433	<0.118	<0.113	23.400
	6-8	0.507	<0.152	<0.154	27.300
	11-13	0.927	<0.092	<0.169	28.800

TABLE 15. EATON SOIL SAMPLE ANALYSES - EAST POND, LOCATION FOUR

DATE	SAMPLE DEPTH (INCHES)	PARAMETER (mg/Kg dry weight) CADMIUM	HEXAVALENT CHROMIUM	FREE CYANIDE	NICKEL
7-26-84	0-6	<0.395	<0.126	<0.157	27.600
	6-8	0.876	<0.091	<0.136	22.500
	11-13	<0.344	<0.083	<0.071	18.200
	16-18	0.991	<0.094	<0.069	21.800
	22-24	1.410	<0.088	<0.060	35.000

TABLE 16. EATON SOIL SAMPLE ANALYSES - EAST POND, LOCATION FIVE

		PARAMETER (mg/Kg dry weight)			
DATE	SAMPLE DEPTH (INCHES)	CADMIUM	HEXAVALENT CHROMIUM	FREE CYANIDE	NICKEL
7-26-84	0-6	0.480	<0.101	<0.126	29.900
	6-8	0.484	<0.122	<0.109	49.700
	11-13	0.803	<0.121	<0.183	19.900
	16-18	<0.305	<0.098	<0.060	19.900

TABLE 17. EATON SOIL SAMPLE ANALYSES - EAST POND, LOCATION SIX

		PARAMETER (mg/Kg dry weight)			
DATE	SAMPLE DEPTH (INCHES)	CADMIUM	HEXAVALENT CHROMIUM	FREE CYANIDE	NICKEL
7-26-84	0-6	0.523	<0.149	<0.160	25.400
	[illegible]	0.423	<0.125	<0.120	38.900

TABLE 18. EATON SOIL SAMPLE ANALYSES - EAST POND, LOCATION SEVEN

		PARAMETER (mg/Kg dry weight)			
DATE	SAMPLE DEPTH (INCHES)	CADMIUM	HEXAVALENT CHROMIUM	FREE CYANIDE	NICKEL
7-26-84	0-6	0.340	<0.114	<0.134	25.700
	6-8	0.844	<0.074	<0.074	25.900
	11-13	1.340	<0.158	<0.222	18.100

TABLE 19. EATON SOIL SAMPLE ANALYSES - EAST POND, LOCATION EIGHT

		PARAMETER (mg/Kg dry weight)			
DATE	SAMPLE DEPTH (INCHES)	CADMIUM	HEXAVALENT CHROMIUM	FREE CYANIDE	NICKEL
7-26-84	0-6	0.407	<0.119	<0.134	26.800
	6-8	0.604	<0.116	<0.185	26.500
	11-13	1.380	<0.062	<0.075	31.400

TABLE 20. EATON SOIL SAMPLE ANALYSES - WEST POND, LOCATION ONE

		PARAMETER (mg/Kg dry weight)			
DATE	SAMPLE DEPTH (INCHES)	CADMIUM	HEXAVALENT CHROMIUM	FREE CYANIDE	NICKEL
7-26-84	0-6	8.590	<0.109	0.349	41.400
	6-8	0.576	1.145	<0.125	32.100
	11-13	0.320	<0.103	<0.202	31.400
	16-18	<0.246	<0.096	<0.201	17.300
	22-24	<0.365	<0.116	<0.075	23.300
8-29-84	0-6	1.840	<0.110	<0.103	51.500
	0-6 (DUP)	1.640	---	---	48.330

TABLE 21. EATON SOIL SAMPLE ANALYSES - WEST POND, LOCATION TWO

		PARAMETER (mg/Kg dry weight)			
DATE	SAMPLE DEPTH (INCHES)	CADMIUM	HEXAVALENT CHROMIUM	FREE CYANIDE	NICKEL
7-26-84	0-6	<0.364	<0.082	<0.208	19.300
	6-8	<0.450	<0.130	<0.150	32.300
	11-13	<0.402	<0.109	<0.074	29.000

TABLE 22. EATON SOIL SAMPLE ANALYSES - WEST POND, LOCATION THREE

		PARAMETER (mg/Kg dry weight)			
DATE	SAMPLE DEPTH (INCHES)	CADMIUM	HEXAVALENT CHROMIUM	FREE CYANIDE	NICKEL
7-26-84	0-6	17.800	<0.085	0.138	78.600
	6-8	0.469	<0.139	<0.152	31.200
	11-13	<0.452	<0.162	<0.157	25.400
	16-18	<0.367	<0.125	<0.213	33.000
	22-24	<0.286	<0.100	<0.075	25.300
8-29-84	0-6	0.313	<0.096	<0.081	48.700

TABLE 23. EATON SOIL SAMPLE ANALYSES - WEST POND, LOCATION FOUR

		PARAMETER (mg/Kg dry weight)			
DATE	SAMPLE DEPTH (INCHES)	CADMIUM	HEXAVALENT CHROMIUM	FREE CYANIDE	NICKEL
7-26-84	0-6	0.463	<0.088	0.180	32.900
	6-8	0.521	<0.106	<0.169	33.200
	11-13	0.365	<0.121	<0.140	17.600
	16-18	2.410	<0.121	<0.075	38.000

TABLE 24. EATON SOIL SAMPLE ANALYSES - WEST POND, LOCATION FIVE

		PARAMETER (mg/Kg dry weight)			
DATE	SAMPLE DEPTH (INCHES)	CADMIUM	HEXAVALENT CHROMIUM	FREE CYANIDE	NICKEL
7-26-84	0-6	0.350	<0.106	<0.143	27.300
	6-8	0.475	<0.154	<0.177	34.800
	11-13	0.257	<0.084	<0.157	38.300

TABLE 25. EATON SOIL SAMPLE ANALYSES - WEST POND, LOCATION SIX

		PARAMETER (mg/Kg dry weight)			
DATE	SAMPLE DEPTH (INCHES)	CADMIUM	HEXAVALENT CHROMIUM	FREE CYANIDE	NICKEL
7-26-84	0-6	<0.340	<0.128	<0.155	29.200
	6-8	0.410	<0.130	<0.183	26.800
	11-13	0.373	<0.136	<0.141	36.700
	16-18	1.470	<0.113	<0.181	41.000
	22-24	0.820	<0.119	<0.081	27.400

TABLE 26. EATON SOIL SAMPLE ANALYSES - WEST POND, LOCATION SEVEN

		PARAMETER (mg/Kg dry weight)			
DATE	SAMPLE DEPTH (INCHES)	CADMIUM	HEXAVALENT CHROMIUM	FREE CYANIDE	NICKEL
7-26-84	0-6	<0.302	2.020	<0.145	18.700
	6-8	0.428	<0.129	<0.160	23.100
	11-13	<0.333	<0.096	<0.168	21.300
	16-18	<0.326	<0.139	<0.201	20.600
8-29-84	0-6	0.257	<0.099	<0.093	46.900

TABLE 27. EATON SOIL SAMPLE ANALYSES - WEST POND, LOCATION EIGHT

		PARAMETER (mg/Kg dry weight)			
DATE	SAMPLE DEPTH (INCHES)	CADMIUM	HEXAVALENT CHROMIUM	FREE CYANIDE	NICKEL
7-26-84	0-6	<0.409	<0.123	<0.152	26.600
	6-8	<0.425	<0.137	<0.191	31.100
	11-13	<0.395	<0.156	<0.173	32.800
	16-18	<0.300	<0.076	<0.193	17.400

Warren Co.
Closure Sects

December 11, 1984

File Copy

Mr. H.Kitscha, Vice President
Eaton Corporation
Industrial control and
Power Distribution Operations
4201 North 27th Street
Milwaukee, Wisconsin 53216

RE: Application #84-141, Actual Closure of Hazardous Waste Facility EPA I.D. #KYD09-895-0306, Bowling Green, Kentucky

Dear Mr. Kitscha:

The Division of Waste Management approves your closure certification correspondence dated October 18, 1984, and that of Mr. Stewart Edwards, P.E., from Dames and Moore, dated October 15, 1984. The two declarations satisfy 401 KAR 35:070 Section 6 for owner and independent professional engineer certification of closure.

Eaton Corporation, Standard Power Division in Bowling Green is no longer considered a hazardous waste facility by the Commonwealth of Kentucky.

If you have any questions, please contact Mr. Geroge Gilbert, P.E., at (502) 564-6716, Ext. 237.

Sincerely,

J. Alex Barber, Director
Division of Waste Management

JAB:GFG:cg

cc: Don Curry, Area Supervisor
Mel Smith, Eaton Corporation, 2901 Industrial Drive, Bowling Green, Ky. 42101
Stuart Edwards, P.E., Dames and Moore, 644 Linn Street, Suite 501, Cincinnati, Ohio 45203

CHARLOTTE E. BALDWIN
SECRETARY

MARTHA LAYNE COLLINS
GOVERNOR

COMMONWEALTH OF KENTUCKY
NATURAL RESOURCES AND ENVIRONMENTAL PROTECTION CABINET
DEPARTMENT FOR ENVIRONMENTAL PROTECTION
FORT BOONE PLAZA
18 REILLY ROAD
FRANKFORT, KENTUCKY 40601

January 7, 1985

MEMORANDUM

TO: Mohammad Alauddin, Chief
Hazardous Waste Review Section

M.A.

FROM: Robert D. Kjelland, Geologist
Solid Waste Review Section

Kj

RE: Eaton Corporation - Bowling Green
Groundwater Monitoring

A letter from Eaton Corporation, dated January 2, 1985, stating that they are no longer subject to groundwater monitoring is accurate. This determination is based on the wording of 401 KAR 35:200 Section 6(2), the approved closure certification and groundwater monitoring data which has never detected contamination.

RDK:cg

cc: Don Curry, Area Supervisor

RCRA GROUND WATER MONITORING
SEMI-ANNUAL REPORT
EATON CORPORATION
BOWLING GREEN, KENTUCKY

JOB NO. 12461-006-21
APRIL 3, 1984

Dames & Moore

Dames & Moore
644 Linn Street
Suite 501
Cincinnati, Ohio 45203
(513) 651-3440

April 4, 1984

Mr. M.H. Smith
Senior Project Engineer
Eaton Corporation
P.O. Box 1158
Bowling Green, Kentucky 42101

Dear Mr. Smith:

Re: Third Year Ground Water
Monitoring Program

In this letter we are transmitting the results and analyses of the first semi-annual sampling of 1984 of the monitoring wells numbered 4, 8, 9, and 10 at Eaton Corporation's Bowling Green facility. This sampling was in accordance with the sample and analysis plan prepared by Dames & Moore for the facility.

Sampling and Analysis Results

Sampling was conducted for all the wells on 1 March 1984. Ground water level measurements were made at the time of the sampling and are presented in Table 1. The ground water flow was opposite that of previous sampling trips, with Well #4 having the lowest water level.

According to regulations for interim status hazardous waste facilities, 40 CFR 265.92, samples were analyzed for the indicator parameters pH and specific conductance in the field and for total organic carbon (TOC) and total organic halogens (TOX) in the laboratory. All indicator parameters were analyzed in quadruplicate. The water quality parameters chloride, iron, manganese, phenols, sodium, and sulfate were also analyzed. Nickel and cyanide were also analyzed specifically for Eaton. Results are presented in Table 1. Most of the concentrations were less than those found during the 1982 sampling. TOXs were again not found at the detection limit of 1 ug/l.

Statistical analyses were performed on three indicator parameters (pH, specific conductance, total organic carbon) by the Student t-test procedure recommended by the Kentucky Division of Waste Management. (The fourth indicator parameter, total organic halogen, was not detectable at any of the four wells.) This test compares the results of the second biannual sampling against the background data collected at the upradient well (#4) in 1982. Results of these statistical tests are presented in Table 2. They show that pH readings in wells #8, #9, and #10 were statistically different.

The laboratory results and our field logs are attached to this letter for your information.

Conclusions and Recommendations

It is Dames & Moore's judgment that the significant changes in pH in well #'s 8, 9, and 10 are likely to be a result of natural changes in ground water as recharge occurs during this time of year. Average pH values were still close to neutrality. According to 401 KAR 35:060 Section 4. (3)(b), Eaton could confirm these significant pH differences by resampling. However, it is our opinion that these differences probably are real and that resampling would confirm this. The next step [Section (4)(a)] is to report these results immediately to the Division of Waste Management. Since the significant differences were for pH only and there is no evidence of any inorganic contaminants (Ni, Cn) due to leakage from the lagoon, we do not recommend any further investigation at the present time. These differences are most likely related to ambient changes in ground water quality, and resampling to confirm statistically significant pH differences is unnecessary.

Another issue is the apparent direction of ground water movement at the time of the March sampling. Ground water levels revealed that well #4, previously the upgradient well, had the lowest water level. According to Section 4.(b) Eaton must immediately modify the well monitoring system to conform to Section 2.(1), which states that there must be one upgradient and three downgradient wells.

Due to the variability of the ground water flow direction, it is our recommendation that, subject to approval by the Division of Waste Management, water levels be obtained to determine flow directions prior to the second semi-annual sampling program. If the flow has returned to the previously existing conditions with northward flow, the present monitoring configuration be maintained. If, however, the flow regime which exists at the time of this samping is maintained, we recommend that monitoring wells 3, 4, and 5 be used as downgradient wells and well 10 be employed as the upgradient observation point.

Sincerely,

DAMES & MOORE

Steve Lamb
Staff Hydrologist

C-54
_____t Edwards
Associate

SL/SE/ds

TABLE 1

CHEMICAL ANALYSES AND GROUND WATER ELEVATIONS
FIRST SEMI-ANNUAL SAMPLING
THIRD YEAR MONITORING PROGRAM

Well No.	Depth to Water (ft)	Ground Water Elevation (ft MSL)	TOC (mg/l)	pH units	Specific Conductance umhos/cm	TOX (ug/l)
4	17.17	521.55	27.9	6.5	288	<1.0
			27.8	6.8	295	"
			27.9	6.9	294	"
			27.8	6.9	294	"
8	10.83	527.75	14.3	6.6	193	<1.0
			14.3	6.8	190	"
			14.7	6.9	191	"
			14.6	6.9	191	"
9	16.26	522.65	27.1	6.5	264	<1.0
			27.0	6.7	267	"
			26.9	6.8	266	"
			26.9	6.8	268	"
10	15.51	523.87	22.7	6.4	238	<1.0
			23.1	6.6	239	"
			22.9	6.7	237	"
			23.0	6.9	236	"

Well	Nickel	Cyanide	Chloride	Iron	Manganese	Phenol	Sodium	Sulfate
4	<0.06	<0.02	17	0.15	<0.02	<0.04	6.71	32
8	<0.06	<0.02	8	0.38	<0.02	<0.04	3.28	35
9	<0.06	<0.02	10	0.25	<0.02	<0.04	2.54	35
10	<0.06	<0.02	14	0.14	<0.02	<0.04	4.68	26

TABLE 2

STATISTICAL ANALYSES
FIRST SEMI-ANNUAL SAMPLING
THIRD YEAR MONITORING PROGRAM

Well Number	Parameter	X_m	S_m^2	W_m	t_c	t*	Significant Difference
4	TOC	27.85	0.0033	0.0008	2.60	-1.87	NO
	pH	6.78	0.0358	0.0090	5.16	-3.73	NO
	Sp. Cond.	292.8	10.25	2.5625	2.60	-5.60	NO
8	TOC	14.48	0.0425	0.0106	2.60	-4.65	NO
	pH	6.80	0.0200	0.0050	4.81	-5.32	YES
	Sp. Cond.	191.3	1.58	0.3950	2.61	-12.13	NO
9	TOC	26.98	0.0092	0.0023	2.60	-2.05	NO
	pH	6.70	0.0200	0.0050	4.81	-6.45	YES
	Sp. Cond.	266.3	2.92	0.7300	2.61	-7.32	NO
10	TOC	22.93	0.0019	0.0005	2.60	-2.89	NO
	pH	6.65	0.0433	0.0108	5.25	-5.32	YES
	Sp. Cond.	237.5	1.67	0.4175	2.61	-9.17	NO

SAMPLING, CHAIN OF CUSTODY AND SHIPPING FOR RCRA GROUND WATER MONITORING

Owner: Eaton
Address: Bowling Green
Attn: Mel Smith

Firm Responsible for Sampling: Dames & Moore
Address: Lexington
Attn:
Job No.: 12461-006

Field Measurements

Well Identification: #4
Date of Sampling: 3/1/84
Time: 1250 CST
Depth to Water: 17.17'
Datum and Elevation:
Ground Water Elevation:
Weather Conditions:

Temperature: 13.2
Sampling Equipment: 5 g.
Casing Volumes Removed:
pH: 6.5 ; 6.8 ; 6.9 ; 6.9
Conductance: 288 ; 295 ; 294 ; 294
Comments:

Sample Preservation and Analyses

Check Samples Shipped	Ref. No.	Container	Preservative	Parameters for Analysis
	1	500 ml plastic	2.5 ml HNO_3 (Total Recoverable)	As, Ba, Cd, Cr, Pb, Hg, Ag, Se, Fe,
✓	2	1 liter plastic	Cool 4° C	F, Cl, SO_4, pH, SC
	3	250 ml plastic	0.25 ml H_2SO_4	NO_3, TOC
	4	1 liter glass	1 ml H_3PO_4, 1 g $CuSO_4$	Phenols
✓	5	1 liter glass	Cool, 4° C	Pesticides*, Herbicides**
	6	250 ml glass	Cool, 4° C, Sodium Thiosulfate	Coliform
	7	1 liter glass	1 ml HNO_3	Gross alpha, gross beta, radium-226,
	8	250 ml plastic	6.25 mg $NaSO_3$	TOX (Circle parameters for analysis

Shipping Information

Shipped or delivered to lab by: Greyhound
Date: 3/1/84 Time:

I hereby certify that to the best of my knowledge ground water samples listed above were obtained in accordance with Eaton's (OWNER) filed sampling and analysis plan, safely containerized and labeled for delivery to the laboratory.

Signature:

RECEIVING LABORATORY: McCoy & McCoy
Address: Madisonville
Attn: Doug Wolfe

QUADRUPLICATE TESTS REQUIRED: TOC, TOX, pH, SC

_____ All samples received intact.
_____ List samples missing or damaged.
Date Received: Time:

Accepted by:

Distribution:
White - w/shipment to laboratory
Canary - to Dames & Moore P.M.
Pink - to Owner
Goldenrod - retained by field engineer

* Pesticides - Endrin, Lindane, Methoxychlor, Toxaphene
** Herbicides - 2,4-D and 2,4,5-TP Silvex
Bottle to be capped with aluminum foil or teflon

SAMPLING, CHAIN OF CUSTODY AND ANALYSIS REQUEST
FOR RCRA GROUND WATER MONITORING

Owner: Eaton
Address: Bowling Green
Attn: Mel Smith

Firm Responsible for Sampling: Dames & Moo
Address: Lexington
Attn:
Job No.: 12461-006

Field Measurements

Well Identification: #8
Date of Sampling: 3/1/84
Time: 1225 CST
Depth to Water: 10.83'
Datum and Elevation:
Ground Water Elevation:
Weather Conditions:

Temperature: 10.9
Sampling Equipment:
Casing Volumes Removed:
pH: 6.6; 6.8; 6.9; 6.9
Conductance: 193; 190; 191; 191
Comments:

Sample Preservation and Analyses

Check Samples Shipped	Ref. No.	Container	Preservative	Parameters for Analysis
	1	500 ml plastic	2.5 ml HNO_3 (Total Recoverable)	As, Ba, Cd, Cr, Pb, Hg, Ag, Se, Fe, F, Cl, SO_4, pH, SC
✓	2	1 liter plastic	Cool 4° C	NO_3, TOC
	3	250 ml plastic	0.25 ml H_2SO_4	Phenols
	4	1 liter glass	1 ml H_3PO_4, 1 g $CuSO_4$	Pesticides*, Herbicides**
✓	5	1 liter glass	Cool, 4° C	Coliform
	6	250 ml glass	Cool, 4° C, Sodium Thiosulfate	Gross alpha, gross beta, radium-226, TOX
	7	1 liter glass	1 ml HNO_3	Circle parameters for analysis
	8	250 ml plastic	6.25 mg K_2SO_3	

Shipping Information

Shipped or delivered to lab by: Greyhound
Date: 3/1/84 Time:

I hereby certify that to the best of my knowledge ground water samples listed above were obtained in accordance with Eaton's (OWNER) filed sampling and analysis plan. Samples are properly preserved, safely containerized and labeled for delivery to the laboratory.

Signature:

RECEIVING LABORATORY: McCoy - McCoy
Address: Madisonville
Attn.: Doug Wolfe

QUADRUPLICATE TESTS REQUIRED
X (TOC, TOX), pH, SC

_____ All samples received intact.
_____ List samples missing or damaged.
Date Received: Time:

Accepted by:

Distribution:
White - w/shipment to laboratory
Canary - to Dames & Moore P.M.
Pink - to Owner
Goldenrod - retained by field engineer

* Pesticides - Endrin, Lindane, Methoxychlor, Toxaphene
** Herbicides - 2,4-D and 2,4,5-TP Silvex
- Bottle to be capped with aluminum foil or Teflon

SAMPLING, CHAIN OF CUSTODY AND ANALYSIS RECORD
FOR RCRA GROUND WATER MONITORING PROGRAMS

Owner: Eaton
Address: Bowling Green
Attn: Mel Smith

Firm Responsible for Sampling: Damas + Moore
Address: Lexington
Attn:
Job No.: 12461-006

Field Measurements

Well Identification: #9
Date of Sampling: 3/1/84
Time: 1145 CST
Depth to Water: 16.26'
Datum and Elevation:
Ground Water Elevation:
Weather Conditions:

Temperature: 11.6
Sampling Equipment:
Casing Volumes Removed:
pH: 6.4; 6.7; 6.8; 6.8
Conductance: 264; 267; 266; 268
Comments:

Sample Preservation and Analyses

Check Samples Shipped	Ref. No.	Container	Preservative	Parameters for Analysis
	1	500 ml plastic	2.5 ml HNO_3 (Total Recoverable)	As, Ba, Cd, Cr, Pb, Hg, Ag, Se, Fe, Mn, F, Cl, SO_4, pH, SC
✓	2	1 liter plastic	Cool 4° C	NO_3, TOC
	3	250 ml plastic	0.25 ml H_2SO_4	Phenols
	4	1 liter glass	1 ml H_3PO_4, 1 g $CuSO_4$	Pesticides*, Herbicides**
✓	5	1 liter glass	Cool, 4° C	Coliform
	6	250 ml glass	Cool, 4° C, Sodium Thiosulfate	Gross alpha, gross beta, radium-226, 22
	7	1 liter glass	1 ml HNO_3	TOX
	8	250 ml plastic	6.25 mg $NaSO_3$	(Circle parameters for analysis).

Shipping Information

Shipped or delivered to lab by: Greyhound
Date: 3/1/84 Time:

I hereby certify that to the best of my knowledge ground water samples listed above were obtained in accordance with Eaton's (OWNER) filed sampling and analysis plan and safely containerized and labeled for delivery to the laboratory.

Signature: JW

RECEIVING LABORATORY: McCoy + McCoy
Address: Madisonville
Attn.: Ray Wolfe

QUADRUPLICATE TESTS REQUIRED FOR:
[✓] TOC, TOX, pH, SC

_____ All samples received intact.
_____ List samples missing or damaged.
Date Received _____ Time _____

Accepted by _____

Distribution:
White - w/shipment to laboratory
Canary - to Damas & Moore P.M.
Pink - to Owner
Goldenrod - retained by field engineer

* Pesticides - Endrin, Lindane, Methoxychlor, Toxaphene
** Herbicides - 2,4-D and 2,4,5-TP Silvex
Bottle to be capped with aluminum foil or teflon

SAMPLING, ANALYSIS AND REPORTING PLAN
FOR RCRA GROUND WATER MONITORING PROGRAMS

Owner: Eaton
Address: Bowling Green
Attn: Mel Smith

Firm Responsible for Sampling: Dames & Moore
Address: Lexington
Attn:
Job No.: 12461-006

Field Measurements

Well Identification: #10
Date of Sampling: 3/1/84
Time: 1045 CST
Depth to Water: 15.51'
Datum and Elevation:
Ground Water Elevation:
Weather Conditions: Inside dome Outside is sunny 5°C

Temperature: 12.4
Sampling Equipment: 5 gal
Casing Volumes Removed:
pH: 6.9; 6.6; 6.7; 6.8
Conductance: 238; 239; 237; 236
Comments:

Sample Preservation and Analyses

Check Samples Shipped	Ref. No.	Container	Preservative	Parameters for Analysis
	1	500 ml plastic	2.5 ml HNO_3 (Total Recoverable)	As, Ba, Cd, Cr, Pb, Hg, Se, Ag, Fe, [illegible]
✓	2	1 liter plastic	Cool 4° C	F, Cl, SO_4, pH, SC
	3	250 ml plastic	0.25 ml H_2SO_4	NO_3, TOC
	4	1 liter glass	1 ml H_3PO_4, 1 g $CuSO_4$	Phenols
✓	5	1 liter glass	Cool, 4° C	Pesticides*, Herbicides**
	6	250 ml glass	Cool, 4° C, Sodium Thiosulfate	Coliform
	7	1 liter glass	1 ml HNO_3	Gross alpha, gross beta, radium-226, 22[illegible]
	8	250 ml plastic	6.25 mg $NaSO_3$	TOX

(Circle parameters for analysis).

Shipping Information

Shipped or delivered to lab by: Greyhound
Date: 3/1/84 Time:

I hereby certify that to the best of my knowledge ground water samples listed above were obtained in accordance with Eaton's (OWNER) filed sampling and analysis plan and safely containerized and labeled for delivery to the laboratory.

Signature: TW

RECEIVING LABORATORY: McCoy & McCoy
Address: Madisonville
Attn.: Doug Wolfe

QUADRUPLICATE TESTS REQUIRED FOR:
ID, (TOC, TOX) pH, SC

_____ All samples received intact.
_____ List samples missing or damaged.

Date Received: Time:

Accepted by:

Distributions:
White - w/shipment to laboratory
Canary - to Dames & Moore P.M.
Pink - to Owner
Goldenrod - retained by field engineer

* Pesticides - Endrin, Lindane, Methoxychlor, Toxaphene
** Herbicides - 2,4-D and 2,4,5-TP Silvex
Bottle to be capped with aluminum foil or teflon

McCOY & McCOY, Inc.
Environmental Consultants

P.O. BOX 238 MADISONVILLE, KENTUCKY 42431
P.O. BOX 1411 PADUCAH, KENTUCKY 42001
P.O. BOX 208 PIKEVILLE, KENTUCKY 41501

REPORT DATE. 3/21/84

Dames & Moore Inc.
Attn: Tom Van Arsdale
2551 Regency Rd., Suite 105
Lexington, KY 40503

	LOCATION NO.	SAMPLE DATE
1.	#4	3/1/84
2.	#8	3/1/84
3.	#9	3/1/84
4.	#10	3/1/84
5.		

aton Corp. Samples

REPORT OF CHEMICAL ANALYSIS

TEST DESCRIPTION		1	2	3	4
TAL ORGANIC CARBON	PPM	27.9	14.3	27.1	22.7
		27.8	14.3	27.0	23.1
		27.9	14.7	26.9	22.9
		27.8	14.6	26.9	23.0
TAL ORGANIC HALOGENS	PPB	<1.0	<1.0	<1.0	<1.0
		<1.0	<1.0	<1.0	<1.0
		<1.0	<1.0	<1.0	<1.0
		<1.0	<1.0	<1.0	<1.0
CHLORIDE	PPM	17.0	8.0	10.0	14.0
I ON	PPM	0.15	0.38	0.25	0.14
NGANESE	PPM	<0.02	<0.02	<0.02	<0.02

Remarks:

1. All analysis performed as per 14th Edition Standard Methods for Water and Wastewater Analysis unless otherwise noted.
2. Laboratory and personnel certified by Commonwealth of Kentucky - Department for Human Resources - Bureau for Health Services for bacteriological analysis.
3. 1 PPM-1 mg/l

By _____
For McCoy & McCoy, Inc.

McCOY & McCOY, Inc.
Environmental Consultants

P.O. BOX 238 MADISONVILLE, KENTUCKY 42431
P.O. BOX 1411 PADUCAH, KENTUCKY 42001
P.O. BOX 208 PIKEVILLE, KENTUCKY 41501

REPORT DATE. 3/21/84

Dames & Moore Inc.
Attn: Tom Van Arsdale
2551 Regency Rd., Suite 105
Lexington, KY 40503

	LOCATION NO.	SAMPLE DATE
1.	#4	3/1/84
2.	#8	3/1/84
3.	#9	3/1/84
4.	#10	3/1/84
5.		

1 Corp Samples

REPORT OF CHEMICAL ANALYSIS

TEST DESCRIPTION		1	2	3	4
OLS	PPM	<0.04	<0.04	<0.04	<0.04
UM	PPM	6.71	3.28	2.54	4.68
FATE	PPM	32.0	35.0	35.0	26.0

narks:

1. All analysis performed as per 14th Edition Standard Methods for Water and Wastewater Analysis unless otherwise noted.
2. Laboratory and personnel certified by Commonwealth of Kentucky - Department for Human Resources - Bureau for Health Services for bacteriological analysis.
3. 1 PPM - 1 mg/l

By _____
For McCoy & McCoy, Inc.

McCOY & McCOY, Inc.
Environmental Consultants

P.O. BOX 238 MADISONVILLE, KENTUCKY 42431
P.O. BOX 1411 PADUCAH, KENTUCKY 42001
P.O. BOX 208 PIKEVILLE, KENTUCKY 41501

REPORT DATE. 3/21/84

PAGE NO.

Dames & Moore Inc.
Attn: Tom Van Arsdale
2551 Regency Rd., Suite 105
Lexington, KY 40503

	LOCATION NO.	SAMPLE DATE
1.	#4	3/1/84
2.	#8	3/1/84
3.	#9	3/1/84
4.	#10	3/1/84
5.		

on Corp Samples

REPORT OF CHEMICAL ANALYSIS

TEST DESCRIPTION		1	2	3	4
EL	PPM	<0.06	<0.06	<0.06	<0.06
IDE	PPM	<0.02	<0.02	<0.02	<0.02

marks:

1. All analysis performed as per 14th Edition Standard Methods for Water and Wastewater Analysis unless otherwise noted.
2. Laboratory and personnel certified by Commonwealth of Kentucky - Department for Human Resources - Bureau for Health Services for bacteriological analysis.
3. 1 PPM = 1 mg/l

By: Doug Wolf
For McCoy & McCoy, Inc.

APPENDIX C
LABORATORY ANALYSES

Resource Recycling Technologies, Inc.
and Divisions
Tennessee Oil and Refining, Inc.
Industrial Liquids Recycling, Inc.
Chem-Fuel, Inc.
2003 Gallatin Road: Madison, Tennessee 37115

May 11, 1981

PURPOSE OF ANALYSIS: At the request of Mr. Mel Smith of Easton-Cutler Hammer, Bowling Green, KY, the metal sludge beds located at the Plant Site and designated on the attached map were sampled. EP Toxicity determinations were made on composite, core samples from each bed. Total and free cyanide determinations were also made on each bed.

TENNESSEE WATTS 1-800-342-3250 OUT OF STATE WATTS 1-800-251-3287 LOCAL 615-859-1300

SAMPLING PROCEDURE: On Friday, May 1, 1981 at 4:00 PM, core samples were taken from two sludge beds located at Eaton, Cutter-Hammer, 2901 Fitzgerald Industrial Drive, Bowling Green, Kentucky. Sample locations are designated on the attached map.

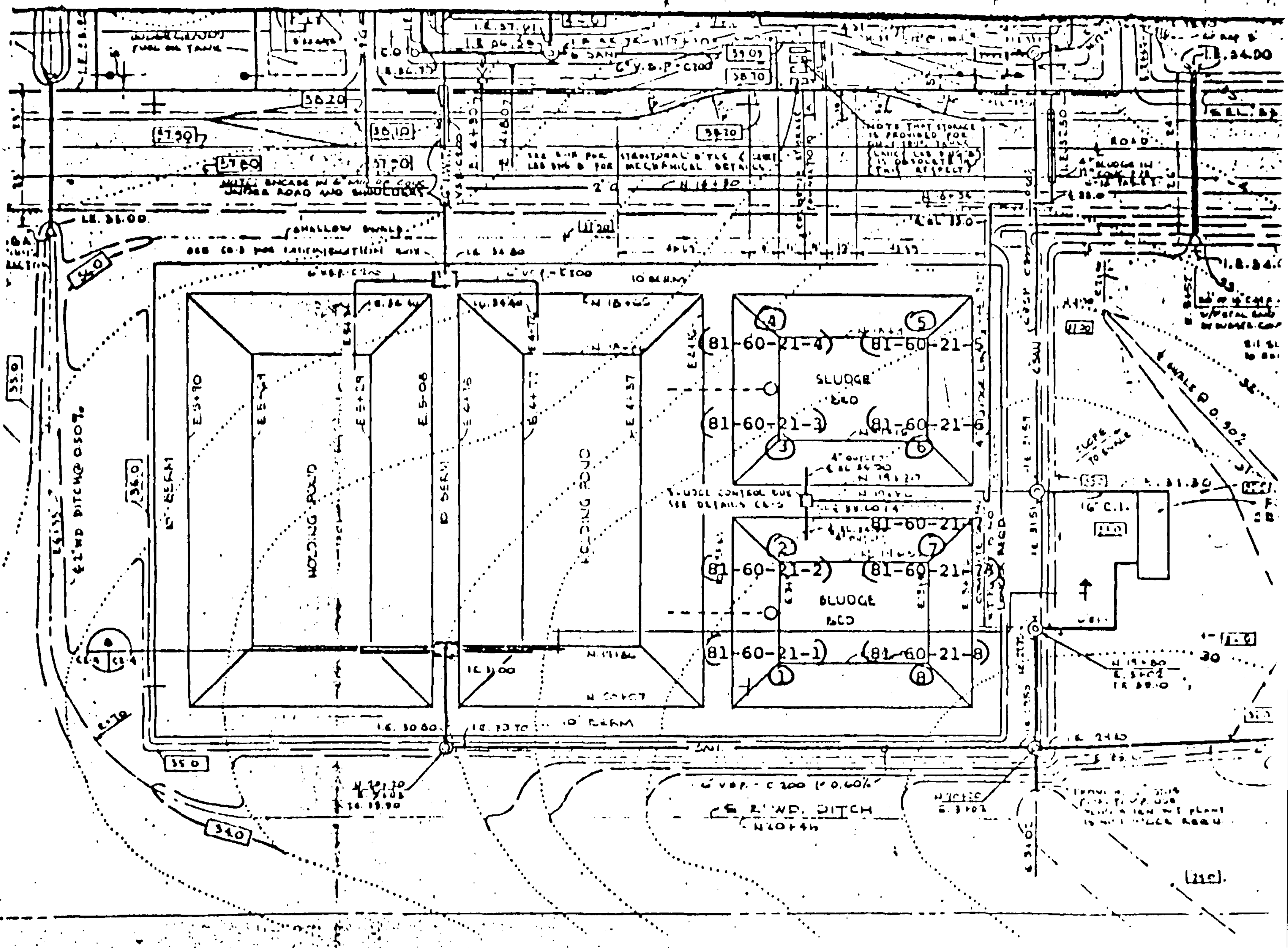
All samples were taken with a "coliwassa-type" sampler. The sampler used is ten feet long and 1-1/4" inside diameter. The sampling was accomplished according to the "coliwassa" method 3.2.1 suggested in EPA SW-846 ("Test Methods for Evaluating Solid Waste - Physical/Chemical Methods"). The sampling coliwassa was lowered into the bed slowly with a twisting motion to assure even levels of waste inside and outside the sampler thus assuring a representative core sample. The samples were taken at each corner of the beds at a distance of approximately 10 feet from each bank. The sampler was lowered until the sludge layer on the bottom of the bed was penetrated. The total depth of the sample was 30" - 36". Duplicate samples were taken at each location and marked and combined. Each location yielded about 500 ml of sample. Additional samples, which were taken in the same manner, were taken at 6. and 7. These samples were placed in glass containers and used for the cyanide analysis.

JCC:bg

Enclosure

Previous Eaton analysis is listed in ACES proposal Appendix A.

C-67


HOLDING POND
HOLDING POND
SLUDGE BED
SLUDGE BED
10' BERM
10' BERM
10' BERM
81-60-21-1
81-60-21-2
81-60-21-3
81-60-21-4
81-60-21-5
81-60-21-6
81-60-21-7
81-60-21-8
SLUDGE CONTROL BOX
SEE DETAILS C6-3
SHALLOW SWALE
FUEL OIL TANK
ROAD
6" V.B.P. - C200 @ 0.60%
℄ 2' WD. DITCH
E.2' WD DITCH @ 0.50%
SWALE @ 0.30%
SLOPE TO SWALE
16" C.I.
I.E. 34.00
I.E. 33.00
I.E. 30.80
I.E. 33.70
E.5+90
E.5+08
E.4+76
E.4+77
E.4+37
35.0
36.0
34.0
37.90
37.60
38.20
38.70
39.09

SAMPLE PREPARATION:

The samples were digested in nitric acid and followed by dilution with hydrochloric acid according to Method 4.1.3, "Method of Chemical Analysis of Waste Water." Method 4.1.4 was used for the silver analysis and the hydrochloric acid was omitted from the procedure.

ANALYSIS:

Total constituent analysis is as follows:

	Cr	Ag	Cu	Ni	Cd	Zn	Sn	Pb	Ba
Composite 1*	750	0.55	625	840	210	2500	150	37.5	110
Composite 2*	725	0.57	675	880	210	4750	140	37.5	135

*Values in ppm

JCC:bg

SAMPLE PREPARATION: Samples 81-60-21-1, 81-60-21-2, 81-60-21-7, and 81-60-21-8 were combined equally to form Composite 1. Samples 81-60-21-3, 81-60-21-4, 81-60-21-5, and 81-60-21-6 were combined equally to form Composite 2. Samples 81-60-21-6A and 81-60-21-7A were used for cyanide determinations.

Composite Samples 1 and 2 were subjected to the EP Toxicity Test Procedure as described in FR 45, (No. 98), May 19, 1980, Appendix II, p.33127, and in "Test Methods for the Evaluation of Solid Waste, Physical/Chemical Methods," SW-846.

ANALYSIS:

	Ba	Cr	Cd	As	Se	Pb	Hg	Ag
Composite 1*	7.0	0.45	3.2	0.025	<0.005	<0.5	0.0011	0.12
Composite 2*	9.0	0.45	7.5	0.040	<0.005	<0.5	<0.0002	0.10

*EP Toxicity Values all given in ppm

	Dissolved Cyanide	Total Cyanide
81-60-21-6A	10 ppm	61 ppm
81-60-21-7A	4 ppm	28 ppm

Composite 1 pH = 12.5
Composite 2 pH = 12.4

CONCLUSION: The sludge beds when subjected to EP Toxicity Determinations were found to yield high values for only cadmium (3.2 ppm and 7.5 ppm). The RCRA maximum allowable limit for cadmium is 1ppm. These sludge beds would, therefore, constitute a defined, hazardous waste. The high pH values(12.4 and 12.5) also put the beds at the limits for the definition of a corrosive. Furthermore, the levels of cyanide in the aqueous phase are quite high and would not be acceptable for discharge under most regulations. However, our preliminary studies indicate that the beds can be dewatered, and the water generated can be treated to yield an acceptable regulated effluent.

Respectfully submitted,

John C. Craig, Ph. D.
Director of Technical Services

		(mg/Kg)	(mg/l)	(mg/Kg)	Leachate (mg/l)
pH	12.5	--	11.8	--	11.6
Cyanide	5.15	168	7.0	192	9.3
Chromium, Hex.	0.26	--	0.33	--	8.34
Chromium, Total	0.38	33.4	0.85	54.6	12.8
Copper	6.8	40.8	5.0	99.1	2.88
Cadmium	0.01	8.68	<0.01	15.5	<0.01
Lead	<0.01	1.17	<0.01	1.31	<0.01
Nickel	0.28	61.5	0.10	78.6	0.07
Zinc	2.67	284.	0.31	188.	1.09
Dry Solids (%)	--	34	--	32.8	--
Silver	0.02	1.40	<0.01	1.31	<0.01

* Equal volumes of filtrate from North and South beds mixed and analyzed.

Leach test was performed by adding 100 g sludge in 400ml deionized water and stirring for 48 hours. Analyses procedures used were those approved by the U. S. Environmental Protection Agency, as published, 40 CFR 136.3, or with modified procedures approved by EPA.

Parameter	Filtrate* (mg/l)	North Sludge (mg/Kg)	North Leachate (mg/l)	South Sludge (mg/Kg)	South Leachat (mg/l)
pH	12.5	--	5.2	--	5.1
Cyanide, (Amen.)	1.18	--	--	--	--
Cyanide, (Tot.)	5.15	168.0	0.01	192.0	0.03
Chromium, (Hex.)	0.26	--	< .01	--	<0.01
Chromium, (Tot.)	0.38	33.4	< .01	54.6	0.03
Copper	6.8	40.8	3.08	99.1	10.1
Cadmium	0.01	8.68	8.48	15.5	13.8
Lead	<0.01	1.17	0.10	1.31	0.20
Nickel	0.28	61.5	15.4	78.6	17.1
Silver	0.02	1.40	0.07	1.31	0.14
Zinc	2.67	284.0	166.0	188.0	106.0
Total Solids	6122	--	3932	--	3276
%Dry Solids	--	34.0	--	32.8	--

*Equal volumes of filtrate from North and South Beds mixed and analysed.

Leach tests were preformed according to methods outlined by the Kentucky Department for Natural Resources and Environment Protection, Division of Hazardous Material and Waste Management.

APPENDIX D

OTHER DOCUMENTS

RECORD OF MEETING

Contract: 9-258-000 Date: August 1, 1986

Confidential: No

Subject Matter: Eaton Corp. Impoundment Closure

Attendees: William Battye, GCA
George Gilbert, Kentucky Department of Environmental Control

During our final trip to the Kentucky State Offices to review RCRA files, I asked George Gilbert about Dames and Moore's use of a threshhold of 2 x background to determine whether further contamination was present at a given sample location at the Eaton facility. I pointed out that the 2 x threshhold had not been mentioned in the approved closure plan. George said that the 2 x threshhold had been approved verbally in a meeting between him, the laboratory supervisor at the State offices, and Dames and Moore. He also stated that at the time of the final analyses, Eaton had removed soil down to bedrock, and the samples were collected from soil pockets in the bedrock.

TELEPHONE RECORD

CONTRACT: 9-258-000 Date: August 20, 1986

Confidential: No

Person Called: Stuart Edwards
Dames and Moore
513-651-3440

GCA Personnel: William Battye

Subject Matter: Eaton Closure

I called Mr. Edwards about the analytical results in the final closure certification for Eaton. The certification stated that a threshhold of 2 x background was used to determine he extent of contamination; however the some of the final analyses showed concentrations higher than 2 x background. Points where the threshhold was exceeded were:

- North Basin, Site 1, 0-6", for nickel;
- South Basin, Site 1, 0-13", for cyanide;
- South Basin, Site 2, 0-6", for free cyanide; and
- South Basin, Site 2, 16-18", for nickel.

Mr. Edwards pointed out that the exceedences were very small, and would not show up if the concentrations were averaged for 8" instead of 6", for instance. He also pointed out that there is no E.P. toxicity standard for nickel. Therefore, the nickel threshhold was used as a guideline and was generally adhered to, but in some cases minor exceedences were tolerated.

A. Surface samples: analysis of all samples for cadmium, chromium, nickel and free cyanide

B. Each 6-inch sample, as required: analysis of samples for the above parameters as determined by analysis of the surface samples

If the results indicate that mobile contaminants have penetrated below the impoundment bottom as determined by comparison with background soil quality, excavation will be conducted to ensure removal of contaminated soil. The backhoe and loader will be utilized to remove 6-inch "lifts" as required, excavating and loading approximately 26 truckloads per day. As such, each 6-inch lift can be removed in 1-1/2 working days.

Removal and disposal of all contaminated soil will be performed within 14 working days of stabilization and removal of the sludge.

3. All equipment used for excavating sludge and liner will be cleaned after removal of the sludge and following the removal of each 6-inch lift during removal of the clay liner and any further excavation of contaminated soil. As above, all wash fluid will be directed to the plant wastewater treatment facility.

4. Final certification will include:

   1. estimate of the amount of free liquid present in the surface impoundments prior to removal, date removed, and the treatment employed for disposal

   2. estimate of decontamination liquid, and accumulated precipitation during closure and their disposal methods (plant wastewater treatment facility)

   3. the amount of contaminated soil removed and disposed offsite

Upon approval of these revisions and the closure plan, a finalized copy of the plan, including revisions, will be submitted.

Thank you for your prompt attention. If you have any questions regarding these revisions, please do not hesitate to call.

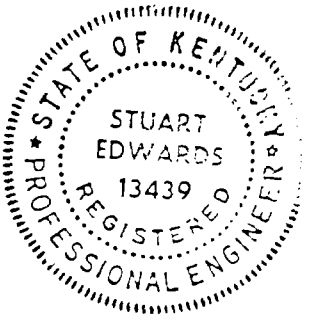
Yours truly,

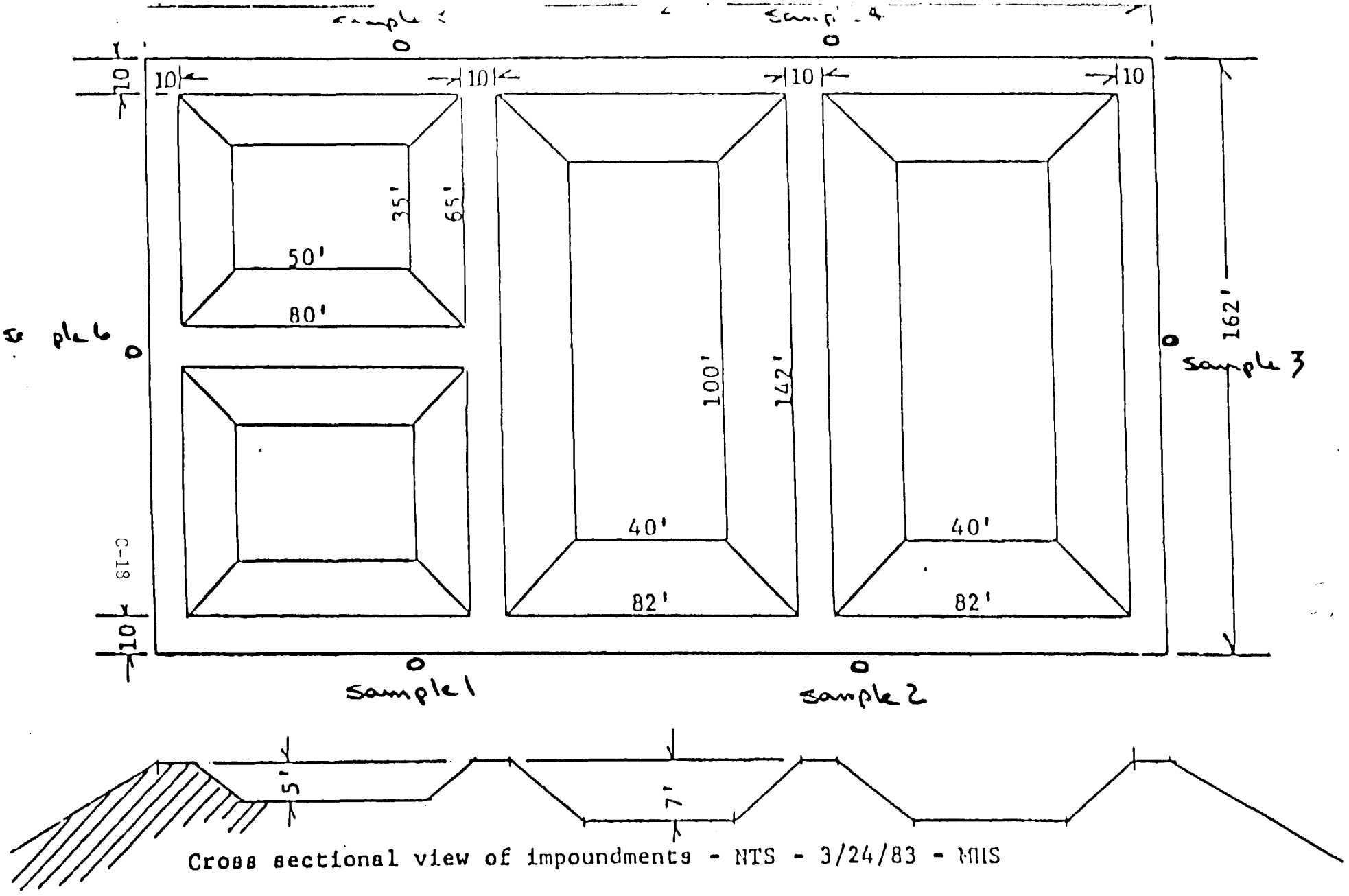
DAMES & MOORE

Stuart Edwards

Stuart Edwards, P.E.
Kentucky Registered Professional
Engineer No. 13439

SE/ds





C-18

Figure 1
Sample Locations for Background Soil Quality Determination

June 20, 1984

Mr. Mel Smith
Eaton Corporation
P.O. Box 1158
Bowling Green, Kentucky 42101

RE: Application #84-~~159~~ 141, Actual Closure Plan for Hazardous Waste Facility EPA I.D. #KYD09-895-0306

Dear Mr. Smith:

The Division of Waste Management approves the closure plan submitted June 13 and 14, 1984. The plan meets the requirements of 401 KAR 35:070 (similar to 40 CFR 265 Subpart G).

A public notice is enclosed for one-time publication in a newspaper of general circulation in the county where the facility is located. Have the publisher forward the affidavit of publication to: Ms. Caroline Patrick Haight, Manager, Permit Review Branch, Division of Waste Management, 18 Reilly Road, Frankfort, Kentucky 40601.

The facility owner/operator is responsible for the cost of the legal notice. The public comment period will expire thirty (30) days from the date of publication as dictated by 401 KAR 35:070 Section 3(4) (identical to 40 CFR 265.112(d)). The Division of Waste Management will inform you of any comments and a notice to proceed with certification of closure at the end of the specified time.

Work on actual closure may proceed with the understanding that a relevent public comment may trigger additional requirements before certification is accepted.

If you have any questions, please contact Mr. George F. Gilbert, P.E., at (502) 564-6716, Ext. 237.

Sincerely,

Original Signed by:

J. Alex Barber, Director
Division of Waste Management

JAB:GFG:cg

cc: Don Curry, Area Supervisor
Stuart Edwards, Dames & Moore, 644 Linn Street, Suite 501, Cincinnati, Ohio 45203

C-586-9-8-29

September 2, 1988

Mr. Narindar Kumar
Site Investigation and Support Branch
Waste Management Division
Environmental Protection Agency
345 Courtland Street, N. E.
Atlanta, Georgia 30365

Date: _____
Site Disposition: _____
EPA Project Manager: _____

Subject: Preliminary Reassessment
Eaton Corporation
Bowling Green, Warren County, Kentucky
TDD No.F4-8806-12

Dear Mr. Kumar:

FIT 4 conducted a preliminary reassessment of the Eaton Corporation in the city of Bowling Green, Warren County, Kentucky. The reassessment included a review of state and EPA file material, completion of a target survey, and a drive-by reconnaissance of the site and surrounding area.

The Bowling Green plant is under the Cutler-Hammer division of Eaton Corporation and is located in a commercial area. This plant produces electrical motor switchgear for industrial applications. Wastes generated at the plant include electroplating sludge, water-based and other types of paint wastes, used lubricating oil, and used chlorinated solvents (Ref. 5).

A disposal area was set up on the property to receive plant waste, and it operated from 1965 until it was deactivated in 1981 (Ref. 1). The disposal area, a series of open lagoons, was approximately 1 acre in size and had a capacity for more than 196,000 gallons (Ref. 17). Effluent from the electroplating operation was treated then directed to the clay-lined sludge beds which, in turn, overflowed to the clay-lined settling ponds. Under a permit from the state of Kentucky, discharges from the ponds were directed to a sinkhole lake on the property (Ref. 1).

A final closure plan for the disposal area was certified in October, 1984 by Dames & Moore. In order for the final closure plan for the disposal area to be approved, 3254 tons of sludge and 3910 tons of contaminated clay liner were removed. Sampling data collected after the removal of the sludge and clay liner indicated elevated levels of chromium, cadmium, free cyanide, and nickel in the soil around the lagoon. The contaminated soil was also removed prior to closure (Ref. 8).

There are two water-distribution systems serving the Bowling Green area. The Bowling Green Water Company serves 12,512 residential hook-ups, some in the city of Bowling Green and some in rural areas. The Warren County Water District system serves 11,316 residential and 486 commercial hook-ups in rural areas. Both water-distribution systems receive water from the same point on the Barren River. There are four known homes within a 3-mile radius that have private wells, and several more probably exist. The closest private well is 10,000 feet away from the reclaimed lagoons (Ref. 4).

The surface water appears to be contained onsite in the sinkhole lake. If surface water were to migrate from the lake onsite it would probably flow in a northern direction and enter Jennings Creek. Jennings Creek flows northward into the Barren River downstream of the Bowling Green intake. There are no surface water intakes for 15 miles downstream of the disposal area (Ref. 15). There are no wetlands or critical habitats near the site, but the Barren River contains a federally endangered species of mussel. In addition, two federally endangered species of bats could be affected by contaminant migration into the cave system under the site(Ref. 15).

There is a softball field that is on company property and may be on top of the old lagoon site (Ref. 11). Approximately 900 people work in the plant (Ref. 10). There is a day-care center 3000 feet to the north and a school 4000 feet to the northeast of the disposal area. There is no access to the old disposal area from Industrial Road, however, there may be access from the back of the property (Ref. 11).

Eaton Corp. is located on the Pennyroyal Plain of the Mississippian Plateau region in South Central Kentucky. The terrain is karst as evidenced by the occurrence of numerous sinkholes and streamless valleys (Ref. 6). Net annual precipitation is 12 inches and recharge of the shallow aquifer is through rainfall (Refs. 6, 14).

Limestone from the Ste. Genevieve Formation is the dominant rock type of the Pennyroyal Plain (Ref. 9). The Ste. Genevieve Limestone is underlain by other members of the Meramec Series which include the St. Louis, Spergen and Warsaw Formations (Ref. 2). Solutional enlarging of conduits takes place in both the Ste. Genevieve and upper St. Louis Formations where together they contain approximately 235 feet of virtually uninterrupted carbonate rock (Refs. 3, 6). The Lost River Chert Bed and the Corydon "Ball Chert" Member of the upper St. Louis Limestone act together as an impermeable liner for the shallow karst aquifer (Ref. 6). Solution features are most extensively developed in the Ste. Genevieve Formation because it contains the purest limestone; large solution openings can yield more than 50 gallons per minute to wells (Refs. 3, 12). Depth to the water table is from 0 to 60 feet in the vicinity of the dump site (Refs. 3, 16).

The Ste. Genevieve Limestone is white to bluish-gray, partly cherty and commonly oolitic. It is medium to thick-bedded and weathers in a blocky fashion to a darker gray color (Refs. 3, 9). The St. Louis Limestone underlies the Ste. Genevieve Limestone and is the bottommost water-bearing unit encountered. This unit is light-gray to black, thin to medium bedded and contains abundant chert nodules (Refs. 3, 6).

Due to the karst geology, there are some underground rivers and cave systems in the area (Ref. 7). The Lost River enters the ground 3,000 feet southeast of the disposal site and comes out of the ground west of Bowling Green (Ref. 11).

Based on the above referenced material, the site's location in a karst area, and the enclosures, a site screening investigation of medium priority is recommended. If you have any comments or questions about this reassessment, please contact me at NUS Corporation.

Very truly yours,

Mary McDonald

Mary McDonald
Project Manager

Approved:

Greg Schank

MM/dwf

Enclosures

cc: Robert Morris

REFERENCE

1. Adams, D.M.. 1981. Plant Manager, Eaton Corporation. EPA Notification of Hazardous Waste Site. July 30.

2. Brown, R., and T. Lambert 1963. Reconnaissance of Groundwater Resources in the Mississipian Plateau Region, Kentucky. Geological Survey Water-Supply Paper 1603.

3. Brown, R., and T. Lambert, 1962. Availability of Groundwater in Allen, Barren, Edmonson, Green, Hart, Logan Metcalf, Monroe, Simpson and Warren Counties, Kentucky. USGS Hydrologic Investigations Atlas HA-32, Sheet 3 f 3.

4. Brock, B. 1987. NUS Corporation Field Log Book F4-8711-12 Bowling Green Toxic Fumes, Bowling Green KY dates of investigation: November 16 and 17, 1987.

5. Burrus, B. 1984. Kentucky Division of Waste Management Memorandum to C. Haight. Re: Uncontrolled site close out for the Eaton Corporation. March 21.

6. Crawford, N. 1987. "Agriculture and Urban Nonpoint Source Pollution Impacts on Karst Aquifers on the Pennyroyal Karst Region of Kentucky, Part 1: Hydrogeology of the Lost River Karst Groundwater Basin, Warren County, Kentucky." Report prepared for Kentucky Natural Resources and Environmental Resources and Environmental Cabinet Division of Water and Barren River Area Development District.

7. Curry, D. 1982. Kentucky Division of Waste Management. Memorandum to Carl Schroeder, Manager, Field Operations Branch, Division of Waste Management. Re: Eaton Corporation/Cutler - Hammer. December 1.

8. Edwards, S. 1984. Associate, Dames & Moore. Final Closure Certification for Eaton Corporation. October 15.

9. Geotechnical & Materials Consultants, Inc. 1982. Hydrogeologic Study of the Bowling Green Area, Warren County, Kentucky as it Relates to a Cyanide - Barium Landfill. Report prepared for Holley - Carburetor Division. February 1.

10. Morgan, S. 1979. Kentucky Division of Waste Management. Memorandum to File. March 23.

11. McDonald, M. 1988. NUS Corporation Field Log Book F4-8806-12, Eaton Corporation, Bowling Green, Kentucky. date of invest. 6-15-88

12. McGrain, P. 1983. The Geologic Story of Kentucky. Kentucky Geological Survey, ser. 11, Special Publication 8.

13. Smith, M. 1982. Project Engineer, Eaton Corporation. Memorandum to Art Curtis. Re: Closure delay for the Easton Corporation. October 20.

14. U. S. Department of Commerce, June 1968. Climatic Atlas of the United States, Washington D.C.: GPO Reprint: National Oceanic and Atmospheric Administration, 1983.

15. US Fish and Wildlife Service. "Endangered and Threatened Species." Region 4 Endangered Species Office, Atlanta, Georgia.

16. USGS. Topographic Quadrangles, 7.5 minute series. Bowling Green South, KY, 1968. Bowling Green North, KY, 1968. Hadley, KY 1973. Rockfield, KY, 1973.

17. Watkins, J. 1978. Kentucky Division of Waste Management. Memorandum to Jack McClure. Re: Cutler - Hammer. August 9.

H. Petitjean

United States
Environmental Protection
Agency

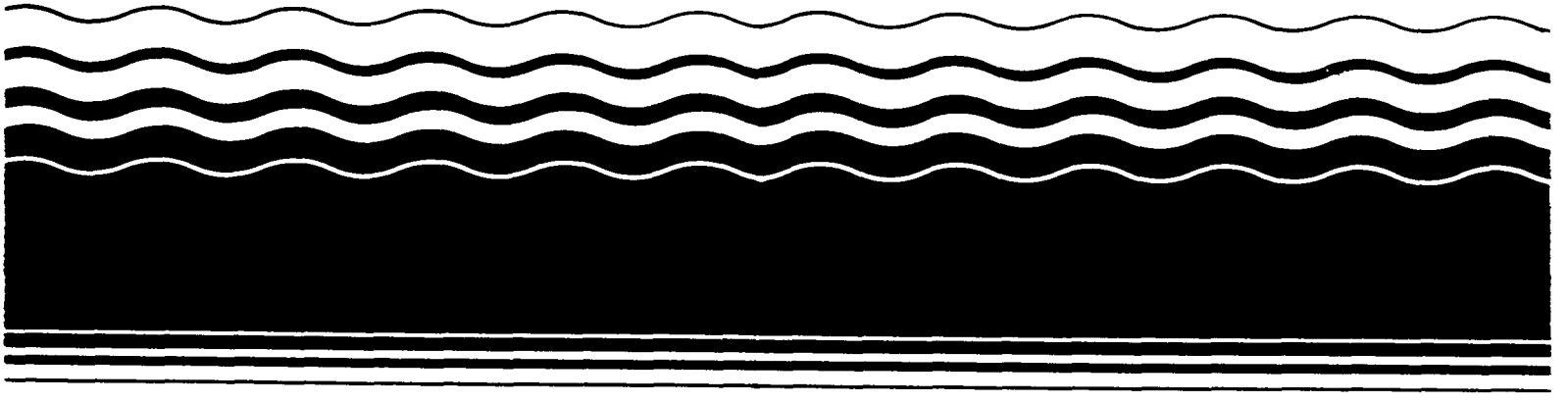
Office of Solid Waste
and Emergency
Response

Publication 9345.1-07
PB92-963377
EPA 540-R-92-026
November 1992

Superfund

EPA

Hazard Ranking System Guidance Manual



2.2 SCORING ALL PATHWAYS AND THREATS

The statutory mandate of the HRS is to assess, to the maximum extent feasible, the relative degree of risk to human health and the environment posed by sites under review. EPA uses the HRS as a screening tool in its site assessment process to identify sites that merit further investigation under Superfund. The site assessment program, however, has limited resources for identifying, evaluating, and scoring large numbers of sites. The competing goals of assessing relative risk to the maximum extent feasible and screening large numbers of sites have caused some confusion over whether to score all pathways and threats at a site when the additional effort will not change the site's listing status. The Agency must balance the need to characterize site risks for all pathways and threats with the constraints imposed by the limited resources available for data collection and analysis.

Generally, all pathways and threats that pose potentially significant risks to human health and the environment should be scored to reflect the importance of that pathway or threat to the overall evaluation of the site. The scorer should use professional judgment to evaluate the potential seriousness of the risk. Criteria to consider when deciding whether a pathway or threat should be scored include:

- Existence of documented releases or contaminated targets
- Potential magnitude of the pathway score
- Availability of scoring data
- Likely range of the overall site score (e.g., near the 28.50 cutoff or not).

In general, score the pathway if there is an observed release, if targets are subject to actual contamination, or if there are major target areas for the pathway.

If the contribution of a pathway or threat to the overall score is minimal, scoring and fully documenting the pathway may not be necessary, even if extensive data are available. As a general guideline, pathways and threats scoring less than 10 points usually do not need to be scored, unless the overall site score is near the cutoff. (Note that near 28.50, the most a 10-point pathway can add to an overall score is approximately half a point. See Section 3.4 for more details.) If a pathway is not scored, the scorer should describe the pathway and available data in the HRS package. This discussion helps present a more thorough and accurate picture of conditions at the site and may be useful later in the remedial process.

If a site score is close to the cutoff, score all pathways even if they add only a few points to the overall site score. In many cases, site scores drop after Quality Assurance review or response to public comments, and the initial inclusion of these additional pathways may keep the site above the cutoff.

In conclusion, the site assessment process should not be viewed simply as an exercise to achieve the maximum HRS score possible by always scoring every pathway, nor as a mechanical process that automatically ends when a score of 28.50 is reached. The scorer must make decisions about whether to score individual pathways or threats based on knowledge of the site, professional judgment and experience, and an understanding how the site score might be affected.

2.3 EVALUATION OF SITES WITH WASTE REMOVALS

A removal action is a relatively short-term response taken to eliminate a threat or prevent more serious environmental problems resulting from the release of CERCLA hazardous substances. Under the original HRS, a site was scored based on conditions that existed prior to a removal action. Under the revised HRS, waste removals (a specific type of removal action in which hazardous substances, or wastes containing hazardous substances, are physically removed from a site) may be considered for scoring purposes under certain circumstances. This section outlines the requirements for evaluating removal actions for HRS purposes, defines a qualifying removal, explains how to determine the cutoff date for qualifying removals, and discusses other relevant scoring issues. The waste removal policy is

designed to provide an incentive for rapid response actions by PRPs, reducing risks to the public and the environment and allowing for more timely and cost-effective cleanups. The Agency's waste removal policy is explained in greater detail in *The Revised Hazard Ranking System: Evaluating Sites After Waste Removals* (OSWER Publication 9345.1-03FS, October 1991).

REQUIREMENTS FOR CONSIDERING REMOVAL ACTIONS

In the preamble to the HRS (55 *Federal Register* 51567, December 14, 1990), EPA established three requirements that must be met for the results of a removal action to be considered in scoring a site with the HRS. A removal action that meets these three requirements is referred to as a qualifying removal.

The first requirement is that the removal action physically remove from the site wastes containing hazardous substances. Note that it is not necessary that all wastes from the site or even all wastes from a particular source be removed; partial removals can be considered in scoring. This requirement for actual physical removal ensures that there is no scoring benefit for simply moving the waste and its associated risks to another portion of the same site. A removal action conducted under Superfund's emergency response program does not necessarily involve physical removal of wastes from the site. For example, Superfund removal actions, as defined in CERCLA section 101(23), may include stabilizing or containing waste on-site through engineering controls or limiting exposure potential by erecting fences or providing alternate water supplies. These types of actions do not constitute a qualifying removal.

The second requirement is that the removal must have occurred prior to the cutoff date applicable to the site. The HRS preamble states that EPA will only consider removals conducted prior to the SI. This requirement encourages prompt action and avoids the need to resample or rescore sites due to waste removals conducted after the SI. Because of differences in site assessment activities for different types of sites (e.g., EPA-lead, state-lead, Federal facilities), criteria for determining the appropriate cutoff date differ among sites. The next section provides detailed guidance on determining a site-specific cutoff date.

The third requirement is that all waste removed must be disposed of or destroyed at a facility permitted, as appropriate, under the Resource Conservation and Recovery Act (RCRA) or the Toxic Substances Control Act (TSCA) or by the Nuclear Regulatory Commission (NRC). This requirement encourages proper disposal of the removed waste and discourages simply moving the waste and its associated hazards to another location.

DETERMINING THE CUTOFF DATE

The paragraphs below describe how to determine the cutoff date for non-Federal and Federal facility sites and for sites with more than one SI.

Non-Federal Facility Sites with One SI

An SI for non-Federal facility sites generally begins with development of a workplan, which often includes the sampling strategy for the site. EPA believes it would disrupt SIs to consider the results of removal actions conducted after this point because to do so could require revising sampling plans, resampling, or rescoring the site. Because of variation in the way Regions have historically tracked SIs, it is impossible to define a single event as the cutoff date for sites that had SIs before the removal policy fact sheet was distributed in December 1991. Therefore, the cutoff date for those sites generally is the date development of a workplan for the SI begins. Examples of dates that can be considered analogous to workplan development for purposes of determining the cutoff date include:

- SI start date in CERCLIS;
- Date of Technical Decision Document (TDD) or Technical Decision Memorandum (TDM) issued for work assignment to develop SI workplan;
- Date when EPA approves the site-specific SI workplan; or
- Date of an SI reconnaissance to develop SI workplan.

If no workplan or analogous event is available, the cutoff date is the earliest documented date that EPA conducted SI activities for the site. For all sites with SIs conducted after December 1991, Regions are expected to enter the date of site-specific workplan approval by EPA as the SI start date in CERCLIS, and that date should be used as the cutoff date for determining qualifying removals.

If EPA determines that previous investigations by other parties (e.g., states, EPA's removal program) are suitable for SI purposes, then the date when drafting of a Superfund SI report collating previous analytical data is begun serves as the cutoff date. The cutoff date is not the date of a state or PRP investigation conducted independently of CERCLA; the cutoff is based on the date these data are collated for Superfund SI purposes.

Non-Federal Facility Sites with Multiple SIs

For non-Federal facility sites with more than one SI, the cutoff date for most sites will be keyed to the first SI. However, the Agency may establish a later cutoff date under certain circumstances:

- If a second SI implementing a completely new sampling strategy is conducted, the Agency may consider basing the cutoff date on workplan development for the second SI. In these cases, considering removals prior to the second SI is not likely to unduly disrupt the site assessment process.
- For sites where the first SI was conducted more than four years prior to HRS scoring, the Agency may consider, on a case-by-case basis, changing the cutoff date to a later date. (CERCLA section 116, added by SARA, mandates that EPA conduct site assessment work within four years of CERCLIS listing.)

The transition to the revised HRS and the follow-up sampling needed for some sites may mean that site assessment activities take longer than four years. Follow-up sampling should not be used to determine a new cutoff date in that situation, even if more than four years have elapsed since the first cutoff date, unless a completely new sampling strategy is implemented.

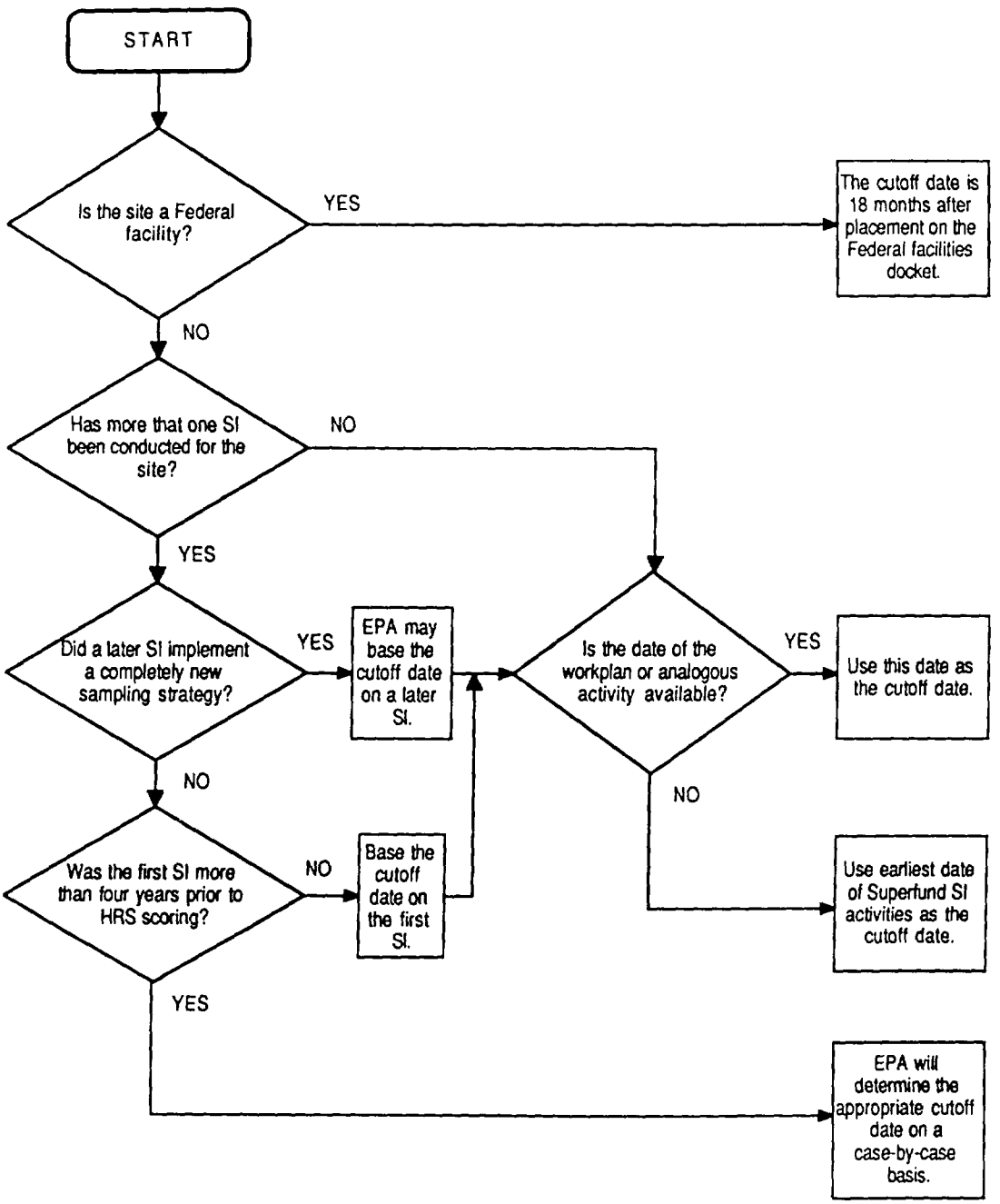
Federal Facility Sites

Federal facility sites undergo a somewhat different site process than other sites. Assessments of Federal facility sites are expected to be conducted within 18 months of their placement on the Federal Agency Hazardous Waste Compliance Docket, set up under CERCLA section 120(c), added by SARA. Therefore, the cutoff date for Federal facility sites is 18 months after the site is placed on the Federal facilities docket.

Summary

Highlight 2-1 is a flowchart for determining a site-specific cutoff date. ***Highlight 2-2*** provides examples of determining the cutoff date for hypothetical sites.

HIGHLIGHT 2-1
FLOWCHART FOR IDENTIFICATION OF THE CUTOFF DATE



HIGHLIGHT 2-2
EXAMPLES OF DETERMINING CUTOFF DATE

SITE #1	
Site Assessment Activities	PA was conducted in May 1988. SI sampling took place in October 1989. The date workplan development for SI began is unknown; however, the date of the Technical Decision Document authorizing the contractor to develop an SI workplan was dated July 1989. HRS package preparation began in January 1991.
Cutoff Date	**July 1989:** Cutoff date is the date analogous to workplan preparation.

SITE #2	
Site Assessment Activities	No PA was conducted. The State conducted an independent (i.e., non-Superfund) investigation of this site, including sampling in May 1988. The State issued a final report of this investigation in December 1988. In May 1990, EPA examined the State's December 1988 report. EPA decided this investigation constituted an SI, and began drafting a Superfund SI report in May 1990. The report was finalized in July 1990. HRS package preparation began in August 1991.
Cutoff Date	**May 1990:** Cutoff date is the date EPA began drafting an SI report using previous analytical data, not the date of the state investigation or report on which EPA's report is based.

SITE #3	
Site Assessment Activities	PA was conducted in January 1989. EPA's emergency response program conducted a removal assessment in June 1989 and removed a number of corroding drums in July 1989. Development of an SI workplan began in November 1989. Sampling took place in March 1990. HRS package preparation began in February 1991.
Cutoff Date	**November 1989:** Cutoff date is based on development of SI workplan, not on the date of the removal assessment.

(continued on next page)

HIGHLIGHT 2-2 (continued)
EXAMPLES OF DETERMINING CUTOFF DATE

SITE #4	
Site Assessment Activities	PA was conducted in March 1986. SI sampling was conducted by an EPA contractor in January 1987. No date for workplan development or analogous date is available. The earliest identified date for Superfund SI activities is December 1986. A second SI with a similar sampling strategy was conducted in September 1989. Limited sampling to collect additional data to support HRS scoring was conducted in April 1991. HRS package preparation began in August 1991.
Cutoff Date	**To be determined:** The cutoff date normally would be December 1986. This date (earliest identified date of Superfund SI activities) is used because the date of workplan development for the first SI is not available. In addition, the September 1989 and April 1991 SI activities did not implement completely new sampling strategies. However, because the first SI was conducted more than four years prior to HRS scoring, EPA may determine a later cutoff date than December 1986 for the site.

SCORING CONSIDERATIONS WHEN A QUALIFYING REMOVAL HAS OCCURRED

A qualifying removal affects scoring of the hazardous waste quantity factor and also may affect the scoring of a number of other HRS factors. Scoring hazardous waste quantity for sites with qualifying removals is discussed in detail in the removal policy fact sheet. For a qualifying removal, do not count the amount of waste removed when scoring hazardous waste quantity. For a non-qualifying removal, score hazardous waste quantity as if the waste was not removed. For a partial qualifying removal, the waste removed generally may be subtracted from the total amount of waste, if the same hazardous waste quantity tier (e.g., both must be based on volume) can be used.

Changes in factors other than hazardous waste quantity caused by a qualifying removal should be considered in scoring a pathway only if all of the following conditions are met.

- Change in the factor was a direct result of a qualifying removal. For example, if during a qualifying removal waste is removed from a surface impoundment and the impoundment is refilled with clean soil, the clean fill can be considered in scoring factors other than hazardous waste quantity (e.g., containment) if the following two conditions are also met.

- No observed release of a hazardous substance associated with the source is established. If an observed release associated with the source involved in the qualifying removal is established, the effects of the removal are not considered in scoring factors other than hazardous waste quantity. This requirement is pathway-specific. If, for example, an observed release is established for ground water but not for air or surface water, then changes in factors other than hazardous waste quantity can be considered in scoring the air and surface water pathways (as long as the other two conditions are also met).

- The removal completely eliminated the source or resulted in a containment factor value of zero for the source. If the removal is partial or if changes that result from the removal would result in a lower, but non-zero, containment factor value, the effects of the removal are not considered in scoring factors other than hazardous waste quantity. Again, this requirement is pathway-specific; the removal may result in a zero containment factor value for air but a non-zero containment factor value for ground water and surface water.

The requirements above apply to all HRS factors other than hazardous waste quantity. Instructions for applying these requirements to specific factors are provided below.

Observed Release

An observed release to a migration pathway, whether documented before or after a qualifying removal, can be used to score likelihood of release. That is, a qualifying removal does not negate the fact that the source has released substances to the environment. However, areas of observed contamination in the soil exposure pathway reflect continuing hazards at the site. Therefore, the soil exposure pathway factor is evaluated based on conditions that exist following a qualifying removal.

Source Containment and Source Type

Scoring of the containment and, for the air pathway, source type factors is affected only by qualifying removals that result in a factor value of 0. Changes in containment or source type that result in a lower but non-zero factor value are not considered in scoring.

Substance-specific Factors

Substance-specific factors cannot be based on a hazardous substance that was completely eliminated from a pathway by a qualifying removal. Such a removal must eliminate all sources of the hazardous substance, and no prior releases of the substance may have occurred. Substance-specific factors include:

- Toxicity
- Mobility
- Persistence
- Bioaccumulation potential
- Gas migration potential.

EPA generally will be unable to document complete elimination of a hazardous substance within the scope of an SI and will rely on PRPs to produce these data. If a portion of a source is eliminated in a qualifying removal, the remaining portion of that source is assumed to contain the same hazardous substances as the removed portion, unless the PRP can document otherwise (e.g., provide analytical results or manifest data that convincingly demonstrate a given hazardous substance is not present in the remaining portion of the source).

Targets Factors

Site-specific TDL (or distance categories) and the distance to nearest targets in migration pathways may change if a qualifying removal meets the three requirements above. In such cases, the source is eliminated from the pathway and, therefore, is not used to measure target distances. If a qualifying removal does not meet the three requirements above (e.g., an observed release of a hazardous substance associated with the source is established or the source containment factor value is non-zero), the source is included when measuring target distances for that pathway.

Reference No. ~~II~~ 21

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IV - ATLANTA, GEORGIA

DATE: DEC 2 1988

SUBJECT: Inspection to Assess Compliance with Closure/Post Closure Requirements Report, Eaton Corporation
EPA I.D. No. KYD 098 950 306

FROM: Wayne Garfinkel, Chief
KY/TN Unit, WES

TO: Susan Diehl, Chief
North Unit, Site Assessment Branch

THRU: John Dickinson, Acting Chief
Waste Engineering Section

12-1-88

At the request of Mr. Scott Gardner, the RCRA Waste Engineering Section has reviewed the above referenced report. There is evidence that Eaton did not comply with the groundwater monitoring requirements of §265.91(a)(l)(i).

Recent changes in RCRA regulations have extended the post-closure care permit requirements for waste piles, surface impoundments, and land treatment units that clean closed under Part 265 closure standards. Under the new requirements, owners and operators of surface impoundments, landfills, waste piles, and land treatment units that certified closure after January 26, 1983, must have post closure care permits unless they can effectively demonstrate that their closure was equivalent to clean closure under 40 CFR §264.

Eaton Corporation certified closure of four surface impoundments in October of 1984. Therefore, RCRA will be requiring them to either submit a post closure application or request an equivalency determination in the near future.

The following are our comments and recommendations concerning the closure and potential sampling at the site. If you have any questions, please contact Jim Webster at ext. 3433.

1. Prior to installation of their Phase II wastewater treatment system Eaton discharged wastewater to a sinkhole under a NPDES permit. Under §261.4(a)(2) industrial wastewater discharges that are point source discharges subject to regulation under Section 402 of the Clean Water Act are excluded from being solid or hazardous waste. However, contaminated materials such as soils from such discharges might be addressed under CERCLA (see attached memo). Therefore, the old outfall should be sampled for the presence of metals.

2. Apparently, the EP toxicity test was used to analyze for the presence of metals in the soils underlaying the surface impoundments. The EPA now recommends the use of total constituent levels with clean closure since potential routes of exposure include dermal contact and ingestion. Consequently, we recommend that the undisturbed soil underlaying the old impoundments should be analyzed for total constituent levels of cadmium, chromium, cyanide, and lead.

3. As specified in §265.91(a)(1)(i), a groundwater monitoring system must be capable of yielding samples that represent background groundwater quality in the uppermost aquifer near the facility. Comparison of Eaton's groundwater data (page c-55 of the report) with a watertable map of the Lost River Karst aquifer prepared by Crawford (1985) (attached) suggests that Eaton might not have monitored the uppermost aquifer beneath the facility.

   The true watertable should lie 30 to 40 feet below the water levels given in the report. This conflicting data suggests that Eaton probably installed wells into a zone of perched water rather than the uppermost aquifer.

It would be useful to have analytical data for the groundwater beneath Eaton. However, collecting representative samples of groundwater and/or surface water at the site would be difficult since:

1. Eaton's monitoring system is no longer in place.

2. The uppermost aquifer beneath the facility is a karst aquifer, consequently, groundwater flow is largely confined to solutionally enlarged openings in the bedrock.

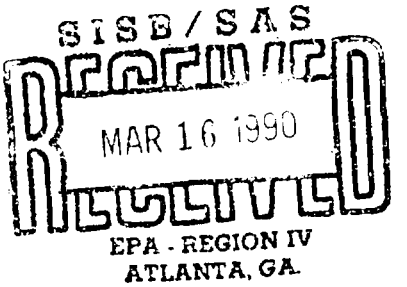
3. Eaton lies near the divide between two groundwater basins (see attached map). Consequently, groundwater beneath the facility may flow in opposite directions.

4. Perennial surface steams are virtually absent in the Lost River Groundwater Basin.

Attachment

COMPLETE
ENG.

R-586-3-0-18



FINAL

ENVIRONMENTAL PRIORITIES INITIATIVE PRELIMINARY ASSESSMENT OF EATON CORPORATION FITZGERALD INDUSTRIAL DRIVE BOWLING GREEN, KENTUCKY 42101 EPA ID #KYD098950306

Prepared Under
TDD No. F4-8910-22
CONTRACT NO. 68-01-7346

Revision 0

FOR THE

WASTE MANAGEMENT DIVISION
U.S. ENVIRONMENTAL PROTECTION AGENCY

MARCH 13, 1990

NUS CORPORATION
SUPERFUND DIVISION

Prepared By	Reviewed By	Approved By
Mitch Cohen, P.E. Project Manager	Greg Schank Assistant Regional Project Manager	Phil Blackwell Regional Project Manager

NOTICE

The information in this document has been funded wholly by the United States Environmental Protection Agency (EPA) under Contract Number 68-01-7346 and is considered proprietary to the EPA.

This information is not to be released to third parties without the expressed or written consent of the EPA.

TABLE OF CONTENTS

Number		Page

TABLES

FIGURES

EXECUTIVE SUMMARY

Eaton Corporation is located on Fitzgerald Industrial Drive in Bowling Green, Warren County, Kentucky. The 17.0-acre facility property consists of a 470,000 square foot plant building and the former location of four surface impoundments. Operations began in 1965 and continue at the present time. Eaton Corporation fabricates, thermomolds, electroplates, paints, and assembles devices for the control of electric motors. Some of these devices include switch boxes, contactors, timer relays, and motor starters. Zinc, tin, nickel, or silver are plated onto metal parts fabricated from steel, copper, alloys, and small amounts of aluminum. The finished product is sold to original equipment manufactures, industrial users, and authorized wholesalers.

The majority of the population within 3 miles of the facility is served with potable water from either the city of Bowling Green or the Warren County Water District. The city of Bowling Green obtains water from two surface water intakes located along the Barren River; however, these intakes are not located on the surface water migration path. The Warren County Water District buys water from the city. A house count identified approximately 146 households not served by municipal water within the 3-mile radius. Those not served by a municipal system use private wells to obtain potable water. Dye tests conducted at a nearby facility showed that the Lost River, a subterranean river, enters Jennings Creek at the surface, Jennings Creek, in turn, flows into the Barren River, downstream from the Bowling Green intakes.

Runoff from the facility enters a small ditch located in the northwest portion of the facility which flows to a sinkhole. The sinkhole was formerly used to discharge treated effluent from surface impoundments. The ranges of several endangered or threatened species are known to exist in the study area. These include the gray bat, the Indian bat, the eastern cougar, the bald eagle, and the arctic peregrine falcon.

The Visual Site Inspection (VSI) conducted during the investigation identified 15 Solid Waste Management Units (SWMUs) and 2 Areas of Concern (AOCs). Three of the SWMUs are recommended for further assessment. All other SWMUs and the AOCs are recommended for no further action.

1.0 INTRODUCTION

The NUS Corporation Region 4 Field Investigation Team (FIT) conducted a Preliminary Assessment (PA) and a Visual Site Inspection (VSI) at the Eaton Corporation facility on December 11, 1989. The task was performed as part of the Environmental Priorities Initiative (EPI) program as stated in Technical Directive Document (TDD) No. F4-8910-22.

1.1 OBJECTIVE

The major objective of the EPI program is to conduct an onsite and offsite inspection of the assigned facility in order to characterize the Solid Waste Management Units (SWMUs), associated releases, and other Areas of Concern (AOCs). The inspection is conducted in a two-phase operation: the Preliminary Review, which includes the review and evaluation of specific file documents; and the Visual Site Inspection (VSI), which identifies all SWMUs, known releases, and AOCs.

1.2 SCOPE OF WORK

The scope of this investigation included the following activities:

- a file search of state and EPA files in an attempt to obtain and review specific documents (RCRA, CERCLA, AIR, and NPDES), which will help characterize the facility,
- development of a detailed site base map to scale including site features, solid waste management unit locations, and photo-documentation areas,
- evaluation of target populations within a 3-mile radius from the site with regard to groundwater, air, and surface water,
- a private well survey within a 3-mile radius of the facility,
- inspection and photo-documentation of all Solid Waste Management Units (SWMUs) and related releases and exposure pathways, and
- inspection and photo-documentation of all Areas of Concern (AOCs).

2.0 SITE DESCRIPTION

2.1 SITE LOCATION

Eaton Corporation is located on Fitzgerald Industrial Drive, approximately 2.5 miles southwest of downtown Bowling Green, Warren County, Kentucky. The facility's latitude and longitude are 36°57'30.05"N and 86°28'47.0" W, respectively (Appendix A).

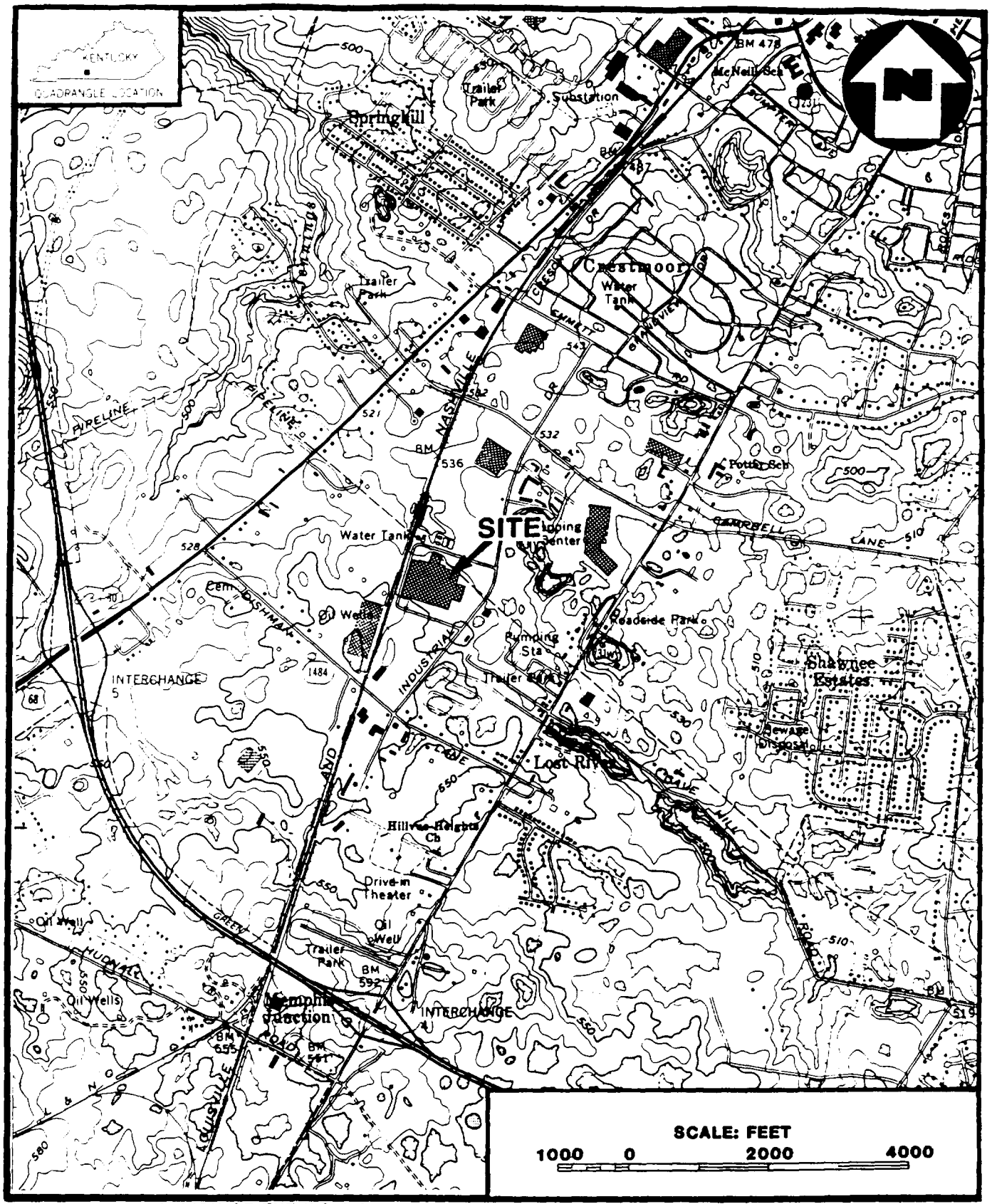
2.2 SITE FEATURES

The facility is located on approximately 17 acres of flat land in an industrial portion of Bowling Green. There are several other large industrial complexes within 0.5 mile of the facility. The major feature of the facility property is a plant building, which comprises about 470,000 square feet (Ref. 1, p. 6). The building contains administrative offices, areas of material preparation, areas of assembly, and two areas where wastewater treatment operations take place. Just to the north of the plant building are the former locations of four closed (two settlement and two sludge-drying) impoundments and a sinkhole which was used to discharge clarified wastewater from the settlement ponds. The sinkhole actually is located just beyond the fence which runs along the northern border of the facility property (Refs. 2; 3).

The facility is surrounded by a 6-foot chain-link fence with a guarded gate. To the west, just beyond the fenceline, are railroad tracks. The property between the plant and the fence lines is well-grassed (Refs. 1, p. 4; 3).

2.3 OWNERSHIP HISTORY

The Eaton Corporation facility in Bowling Green, Kentucky has been operating since 1965. The property is owned by the city of Bowling Green and is leased to Eaton Corporation. Eaton Corporation maintains headquarters in Cleveland, Ohio (Refs. 1, p. 6; 4; 5).

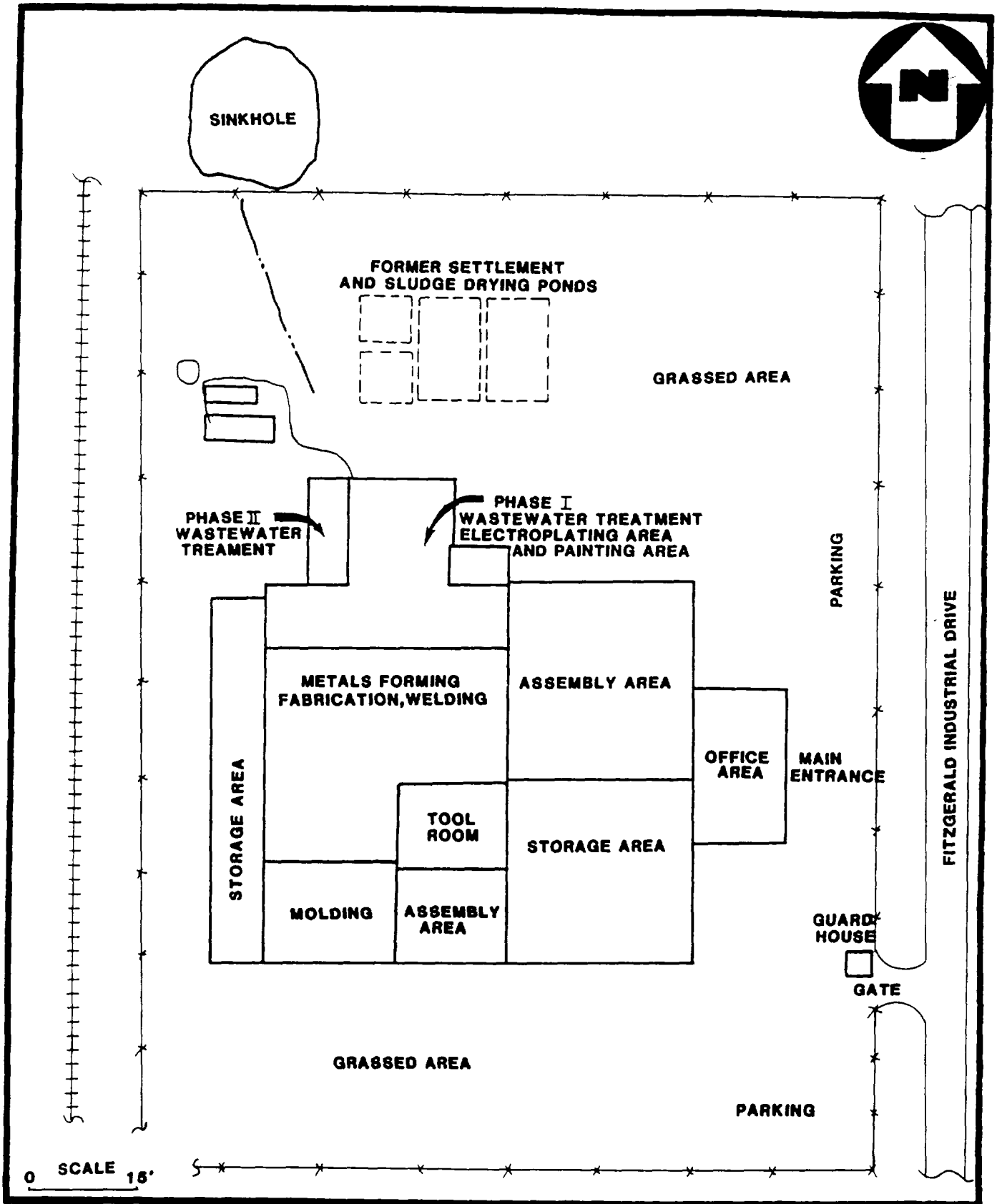


BASE MAP IS A PORTION OF THE U.S.G.S. 7.5 MINUTE QUADRANGLE BOWLING GREEN SOUTH, 1968, KENTUCKY.

SITE LOCATION MAP
EATON CORPORATION
BOWLING GREEN, WARREN COUNTY, KENTUCKY

FIGURE 2-1

NUS CORPORATION



SITE LAYOUT MAP
EATON CORPORATION
BOWLING GREEN, WARREN COUNTY, KENTUCKY

FIGURE 2-2

NUS CORPORATION

2.4 NATURE OF OPERATIONS

This Eaton Corporation plant is one of many nationwide. Operations at the facility include the fabricating, thermomolding, electroplating, assembly, and painting of devices for the control of electric motors. Some of these devices include switch boxes, contactors, timer relays, and motor starters. Eaton Corporation products ultimately are the connection between electrical power and a running motor. Parts are either fabricated from metals such as sheet steel, copper, alloys, and small amounts of aluminum or molded from thermoplastic. The metals are then electroplated with either zinc, tin, nickel, or silver. Some of the assembled units are pretreated and then painted as part of the finishing process. The completed devices are commonly used on industrial and commercial machinery where the mechanical machine function needs to be controlled. In addition, some of these devices are used to protect the motor from heat damage caused by overcurrents. Typical customer base consists of original equipment manufacturers, industrial users, and the resale market through authorized distributor wholesalers (Refs. 1, p. 5; 6).

The facility uses a two-phase wastewater treatment system within the plant to treat wastewater produced as a result of plating, metal finishing, and solvent cleaning operations. Treated effluent is discharged to the municipal sewer system (Permit No. P010). Sludges designated as RCRA F006 are dewatered and then shipped to the Heritage Environmental Services facility in Indianapolis, Indiana. Scrap metal is taken away and recycled in Louisville, Kentucky. Waste solvents are stored in drums and shipped by Heritage Transport, Inc. within the 90 day limit to the Heritage Environmental Services Facility in Indianapolis, Indiana (Refs. 1, p. 13; 5). Prior to installation of Phase II of the wastewater treatment system in 1981, four closed RCRA surface impoundments were used to treat wastewater generated by the plant. After settlement, effluent was discharged into a sinkhole under an NPDES permit (Refs. 1, p. 13; 7).

2.5 PERMIT AND REGULATORY HISTORY

On November 19, 1980, Eaton Corporation filed a RCRA Part A Hazardous Waste Permit application with the state of Kentucky as a storage and treatment facility. The facility operated four surface impoundments for settlement and sludge drying as part of wastewater treatment. During June of 1984, Eaton Corporation submitted a closure plan for the deactivation and remediation of the surface impoundments. Installation of the Phase II wastewater treatment plant had rendered the use of settlement and sludge drying impoundments obsolete. Final closure was approved by the state on

December 11, 1984. The state also dropped Eaton Corporation from consideration as a hazardous waste facility at that time. The current status of the facility is that of generator. The facility is currently in compliance with RCRA regulations for generators according to the state (Refs. 8; 9; 10).

3.0 ENVIRONMENTAL SETTING

The Environmental Setting section, in addition to the Topographic Map (Appendix A), and Preliminary Assessment Form (Appendix B) provides information to evaluate the potential for a release to groundwater and surface water resources and other receptors.

3.1 WATER SUPPLY

The majority of the population within 3 miles of the Eaton Corporation facility is served by municipal water systems. The city of Bowling Green serves approximately 13,000 connections with water obtained from two surface water intakes. These intakes, however, are not located along the extended surface water pathway. The Warren County Water District serves about 12,460 connections with water it buys from the city of Bowling Green (Ref. 1, p. 3; Appendix A).

The population not served by a public water system uses private wells for potable water. A house count using topographic maps identified approximately 146 households not on a municipal water system within the 3-mile radius. Between the 3- and 4-mile radii, approximately 101 households are not served by a municipal system. The estimated population served by groundwater within 3 miles of the facility is, therefore, 555 (146 households x 3.8 people/household) (Appendix A).

3.2 SURFACE WATER

Surface water runoff from the facility enters a ditch, which, in turn, flows to the sinkhole just north-northwest of the plant building. Railroad tracks and related roadbed act as a barrier to flow to the west, and Fitzgerald Industrial Drive is a barrier to the east. Jennings Creek is located about 4000 feet northwest of the facility. It is obvious that surface water migration to the creek is highly unlikely. Rhodamine WT dye tests at a facility located about 0.25 mile north of Eaton Corporation proved that the Lost River, a subterranean river, flows into Jennings Creek. The Lost River flows about 0.25 mile east of Eaton Corporation. It is highly likely that underground solution cavities in the karstic limestone provide an underground pathway from the sinkhole to the Lost River (Ref. 11).

Jennings Creek flows about 6.0 stream-miles and then enters the Barren River. This point of confluence is about 5.0 stream-miles upstream from one of Bowling Green's intakes, as well as 8.0 miles from the other city intake (Appendix A).

3.3 HYDROGEOLOGY

Bowling Green has a temperate climate that is greatly influenced by moisture-laden pressure systems moving northeastward from the Gulf of Mexico (Ref. 12, p. 3). The average annual precipitation is approximately 48 inches (Ref. 13, p. 43). The 1-year, 24-hour rainfall is between 2.5 and 3.0 inches, and the net annual precipitation is approximately 12 inches (Refs. 14, p. 93; 13, pp. 43, 63).

The Eaton Corporation facility is located within the Pennyroyal Plain physiographic area of the Central Lowlands Physiographic Province (Ref. 12, p. 2). This area is a flat plain containing numerous sinkholes and disappearing surface streams flowing northwest (Ref. 12, pp. 2, 3). Underlain primarily by carbonate rocks, the Pennyroyal plain is a classic karst landscape, and is known worldwide for its numerous karst features (Ref. 15, p. 16).

Up to 8 feet of clayey surficial deposits overlie the outcropping Ste. Genevieve Limestone at the area (Refs. 11, plate 1; 16). The Ste. Genevieve Limestone consists of white to bluish-grey, fine to coarsely crystalline limestone, which contains dark bluish-grey chert. The thickness of this unit ranges from 160 to 250 feet, and it rests conformably upon the St. Louis Limestone. The St. Louis Limestone is a light-grey to black, fine to coarsely crystalline limestone, which is dolomitic or argillaceous in places and contains abundant black chert nodules and stringers. The St. Louis Limestone is approximately 230 to 300 feet thick in Bowling Green, and it rests conformably upon the 100 to 160 foot thick Salem and Warsaw Limestones. The Salem and Warsaw Limestones are typically light- to dark-grey, granular to fine grained, massive, cross bedded, and cross laminated limestones, which are argillaceous in places. The lower portion of this unit is comprised of medium- to dark-grey , brittle, siltstone (Ref. 17).

Groundwater in the Bowling Green area has been attributed to secondary porosity openings in the underlying limestone formations. The aquifers within these formations have been divided into units that are, for the most part, synonymous with local drainage basins. The most significant aquifer and the aquifer of concern at the facility is the unconfined Graham Spring aquifer (Ref. 11, pp. 18, 22, plate 3). This aquifer's main zone of saturation is approximately 50 feet below land surface in the area (Ref. 11, plate 3). Wells completed in the Graham Spring aquifer range from 50 to 350 feet deep, indicating that this aquifer likely extends from the Ste. Genevieve Limestone into the underlying

St. Louis Limestone (Ref. 12, pp. 18, 19, 23, plate 1). The gradient for the Graham Spring aquifer's potentiometric surface is very low; however, groundwater flow probably follows topographic lows northwest and discharges into Jennings Creek (Ref. 12, plate 3). Disappearing surface streams and sinkholes in the area form direct hydrologic connections between land surface and groundwater reservoirs (Ref. 15, plate 3).

3.4 CRITICAL HABITATS/ENDANGERED SPECIES

There are no critical habitats in Warren County, Kentucky; however, Mammoth Cave National Park is located about 25 miles northeast of the facility. Several federally endangered or threatened species have been identified for general distribution in the study area. These species include the gray bat, the Indian bat, the eastern cougar, the bald eagle, and the Arctic peregrine falcon (Refs. 18; 19). Also, the Barren River is commonly used for recreational fishing, boating, and swimming (Ref. 20).

4.0 VISUAL SITE INSPECTION (VSI)

The Visual Site Inspection (VSI) of the Eaton Corporation facility was performed on December 11, 1989. The VSI focused on the past and present waste streams at the facility in order to identify all Solid Waste Management Units (SWMUs), and any Areas of Concern (AOCs), and to collect information beneficial in assessing their potential to release hazardous waste or constituents to the environment.

4.1 SOLID WASTE MANAGEMENT UNITS (SWMUs) AND OTHER AREAS OF CONCERN (AOCs)

Fifteen SWMUs and two AOCs were identified at the Eaton Corporation facility during the Visual Site Inspection. Solid Waste Management Units identified include the former location of the settling/sludge drying impoundments, the former NPDES permitted discharge sinkhole, a drum storage area, five roll on/roll off, 20-cubic-yard dumpsters, three electroplating areas, a paint booth, Phase I and Phase II of the Wastewater Treatment Plant, and the hazardous waste drum storage area. The Areas of Concern were comprised of two scrap areas outside of the plant building (Ref. 1, p. 13).

During the Visual Site Inspection, personnel representing Eaton Corporation accompanied the NUS Field Investigation Team members. The VSI was conducted in a fashion which attempted to follow the same route as waste handling at the facility; however, eight SWMUs and the two AOCs were located outside of the facility's normal area of operation (Refer to Figure 4-1).

All SWMUs and AOCs delineated on Table 4-1 are located in Figure 4-1 and further discussed in this section. Figure 4-1 also shows photograph locations. Weather during the VSI was cold, breezy with snow flurries. Ground conditions were wet (Ref. 1).

4.2 VSI PARTICIPANTS

The following Eaton Corporation and NUS personnel were present during the Visual Site Inspection (VSI).

Mitch Cohen, P.E.
NUS Corporation
Civil Engineer

Julie Keller
NUS Corporation
Chemist

Roland McAbee
Eaton Corporation
Manufacturing Services Manager

Steve F. Fesko
Eaton Corporation
Principal Engineer

Sharon L. Sigler
Eaton Corporation
Corporate Attorney

Jerry Wooten
Eaton Corporation
Plant Engineer

TABLE 4-1

SWMU IDENTIFICATION SUMMARY
EATON CORPORATION
BOWLING GREEN, KENTUCKY

SWMU Number	Name of Unit	Years of Oper.	Waste Managed	Evidence of Release	Recommendation		
					No Further Action	Further Assessment	Sampling
1	Former location of settling and sludge drying ponds (SWMU)	19	Wastewater from plating, metal finishing, solvent cleaning, and painting operations	None			X'
2	Discharge sinkhole (SWMU)	19	Effluent from the former settlement ponds	None			X"
3	Scrap area (AOC)	1	Sealed or dry motors	None	X		
4	Scrap area (AOC)	1	Abandoned metal cabinets, racks, equipment, and scrap metal	None	X		
5	Drum storage (SWMU)	8	Mostly empty 55-gallon drums of acids, toluene, paint. Some drums were either full or partially full	None		Y	

X' It may be necessary to sample on a low-priority basis for the presence of contaminants, which may have migrated to the nearby sinkhole.
X" It may be necessary to sample on a low-priority basis for the presence of contaminants in the sinkhole.
Y Partial drums should be stored in the hazardous waste drum storage area (SWMU No. 17).

TABLE 4-1

SWMU IDENTIFICATION SUMMARY
EATON CORPORATION
BOWLING GREEN, KENTUCKY

SWMU Number	Name of Unit	Years of Oper.	Waste Managed	Evidence of Release	Recommendation		
					No Further Action	Further Assessment	Sampling
6	Roll on/roll off dumpster (SWMU)	25	Scrap wooden pallets	None	X		
7	Roll on/roll off dumpster (SWMU)	25	Common steel scrap	None	X		
8	Roll on/roll off dumpster (SWMU)	25	Mixed steel scrap	None	X		
9	Roll on/roll off dumpster (SWMU)	25	Stainless steel scrap	None	X		
10	Roll on/roll off dumpster (SWMU)	1	F006 plating sludge	None	X		

X' It may be necessary to sample on a low-priority basis for the presence of contaminants, which may have migrated to the nearby sinkhole.
X" It may be necessary to sample on a low-priority basis for the presence of contaminants in the sinkhole.
Y Partial drums should be stored in the hazardous waste drum storage area (SWMU No. 17).

TABLE 4-1

SWMU IDENTIFICATION SUMMARY
EATON CORPORATION
BOWLING GREEN, KENTUCKY

SWMU Number	Name of Unit	Years of Oper.	Waste Managed	Evidence of Release	Recommendation		
					No Further Action	Further Assessment	Sampling
11	Plating bath line (SWMU)	9	32 tanks with either alkaline, nitric acid, sulfuric acid, hydrochloric acid, zinc, sodium dichromate, copper, silver, nickel, or tin	None	X		
12	Plating barrel line (SWMU)	17	32 tanks with either alkaline, zinc, nickel, tin, copper, hydrochloric acid, nitric acid, or sodium dichromate	None	X		
13	Auto-zinc plating machine (SWMU)	4	33 tanks with either alkaline, sodium dichromate, soap cleaner, hydrochloric acid, or nitric acid	None	X		
14	Paint booth (SWMU)	25	Nonhazardous paint vapor	None	X		

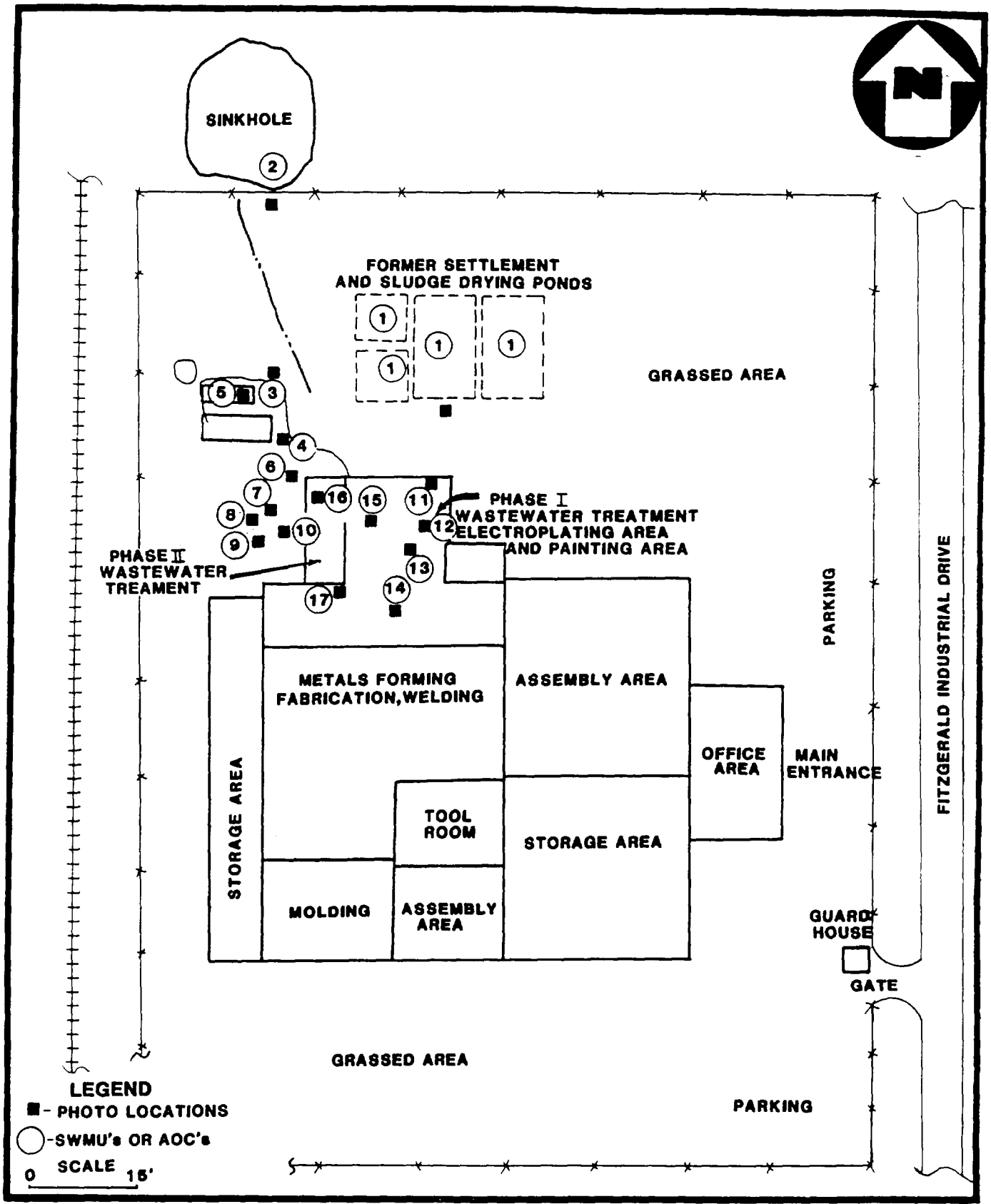
X' It may be necessary to sample on a low-priority basis for the presence of contaminants, which may have migrated to the nearby sinkhole.
X" It may be necessary to sample on a low-priority basis for the presence of contaminants in the sinkhole.
Y Partial drums should be stored in the hazardous waste drum storage area (SWMU No. 17).

TABLE 4-1

SWMU IDENTIFICATION SUMMARY
EATON CORPORATION
BOWLING GREEN, KENTUCKY

SWMU Number	Name of Unit	Years of Oper.	Waste Managed	Evidence of Release	Recommendation		
					No Further Action	Further Assessment	Sampling
15	Phase I wastewater treatment area (SWMU)	13	Painting and solvent cleaning operations wastewater	None	X		
16	Phase II wastewater treatment area (SWMU)	8	Pretreated wastewater from Phase I; F006 sludge is generated here.	None	X		
17	Hazardous waste drum storage area (SWMU)	1	55-gallon drums of paint waste, mixed F003 and F005, waste freon, 1,1,1-trichlorethane, waste nickel and F006	None	X		

X' It may be necessary to sample on a low-priority basis for the presence of contaminants, which may have migrated to the nearby sinkhole.
X" It may be necessary to sample on a low-priority basis for the presence of contaminants in the sinkhole.
Y Partial drums should be stored in the hazardous waste drum storage area (SWMU No. 17).



SOLID WASTE MANAGEMENT UNITS (SWMU) AND OTHER AREAS OF CONCERN (AOC) LOCATIONS EATON CORPORATION BOWLING GREEN, WARREN COUNTY, KENTUCKY

FIGURE 4-1

NUS CORPORATION

SWMU NUMBER: 1

SWMU NAME: Former location of four Settlement/Sludge Drying Impoundments

SWMU DESCRIPTION: The impoundments were located in the north portion of the facility. Prior to installation of the present Phase I and II wastewater treatment system, the four impoundments were used to treat plant wastewater and sludge. First, plant wastewater was discharged to the two settling impoundments. After settlement, the effluent was discharged to a nearby sinkhole (SWMU No. 2) under NPDES permit. Sludge from the two settlement impoundments was then placed into the two sludge drying impoundments. Water which collected in the drying impoundments was allowed to overflow into the settling impoundments. Each of the two sludge beds was 35' x 50', and each of the two settling ponds was 40' x 100'. The depths of all the impoundments were about 5 feet. The impoundments were lined; however, the liner material which was used is unknown (Refs. 1, p. 13; 5; 7, pp. 4-6).

DATE OF START-UP: According to Eaton Corporation personnel, this unit is believed to have been placed in service in 1965 (Ref. 1, p. 13).

DATE OF CLOSURE: The impoundments were certified closed by the state of Kentucky on December 11, 1984 (Ref. 9).

METHOD OF CLOSURE: The impoundments were deactivated in 1981 after the Phase II wastewater treatment system was brought on-line. Closure activities began on July 29, 1983. First, an inflatable building was constructed to cover the impoundments. Standing water was removed and sent to the wastewater treatment system in the Eaton Corporation plant. A total of approximately 100,000 gallons were removed and treated by July 1984. Final stabilization of the sludge commenced with the addition of lime kiln flue dust. The stabilized sludge, liner, and contaminated soil were excavated and shipped to CECOS Environmental located in Williamsburg, Ohio. Sampling of surrounding soil was conducted, and several contaminated areas were identified, excavated, and disposed of accordingly. Approximately 7200 tons of excavated sludge were disposed of. Dames and Moore had been retained by Eaton Corporation to conduct groundwater monitoring between 1981 and 1984. According to

the consultant, no contamination was detected. In 1985, Eaton Corporation was relieved of its requirement to monitor groundwater (Refs. 1, p. 13; 7, pp. 5-7).

In 1986, an inspection showed that the four impoundments had been backfilled, and all contaminated soil and sludge had been disposed of at the CECOS hazardous waste facility. However, soil samples previously collected had exceeded the 2-times-background threshold, approved by the state of Kentucky, for hexavalent chromium, free cyanide and nickel. It appears that since groundwater samples had never revealed contamination, the state of Kentucky approved closure, regardless of soil sample excess of contaminant thresholds (Ref. 7, pp. 8-12).

WASTES MANAGED: Wastewaters generated by plating, metal finishing, solvents cleaning, and painting operations were treated in the impoundments. The sludges were designated as F006 plating sludge.

RELEASE CONTROLS: Apparently the impoundments were bermed and lined; however, the materials used are not known.

RELEASE HISTORY: The sludge drying ponds were allowed to overflow into the settlement impoundments. No other releases were known according to Eaton Corporation personnel (Ref. 1, p. 13).

INTERIM RECOMMENDATIONS: Further Assessment: Although groundwater samples did not reveal contamination, soil samples had. It may be necessary to resample groundwater near the impoundment and sinkhole (SWMU No. 2) to ensure that contamination has not migrated to a known source of groundwater.

A recent EPA internal correspondence conveyed concerns about considering addressing the impoundments and related discharge points under CERCLA, using total constituent levels for metals analysis instead of EP toxicity in closures, and resampling groundwater, since it is believed that monitoring wells were actually developed in a zone of perched water and not the uppermost aquifer (Ref. 21).

PHOTOGRAPH NO. 1A, 1B, 1C

SWMU NUMBER: 2

SWMU NAME: Discharge Sinkhole

SWMU DESCRIPTION: Effluent from the formerly used treatment impoundments (SWMU No. 1) was discharged to the sinkhole located just beyond the north-northwest fence line. A ditch still exists on the facility property, which carries runoff to the sinkhole. The discharge was permitted under the NPDES program.

DATE OF START-UP: According to Eaton Corporation personnel, this unit is believed to have been placed in service in 1965.

DATE OF CLOSURE: Although the sinkhole still exists, discharge ceased in 1981 after Phase II of the wastewater treatment system was installed and placed on-line.

WASTES MANAGED: The sinkhole received effluent from the formerly used settlement impoundments. Sludge that settled out of the wastewater was designated as F006 plating sludge.

RELEASE CONTROLS: There were no release controls. The sinkhole is a surface expression of groundwater.

RELEASE HISTORY: There is no history of any releases other than treated wastewater to the sinkhole according to Eaton Corporation personnel (Ref. 1, p. 13).

INTERIM RECOMMENDATIONS: Further Assessment: Sampling on a low-priority basis may be necessary to determine if contaminants had migrated to the sinkhole from the impoundments.

PHOTOGRAPH NO. 2

AOC NUMBER: 3

AOC NAME: Scrap Area No. 1

AOC DESCRIPTION: Concrete deck underlying two storage sheds in the northwest portion of the facility property. The approximately 4' x 10' area is used to store five sealed or dry motors and metal racks. At the time of the inspection, four of the motors and all of the racks were on the grass, just off the concrete deck.

DATE OF START-UP: According to Eaton Corporation personnel, the scrap was placed in this location during July 1989.

DATE OF CLOSURE: The area was active during the VSI.

WASTES MANAGED: Abandoned or scrap motors and metal racks are stored in this area.

RELEASE CONTROLS: There are no release controls for this area.

RELEASE HISTORY: There have never been any releases from this area according to Eaton Corporation personnel (Ref. 1, p. 13).

INTERIM RECOMMENDATIONS: No Further Action. The concrete and grassed area appeared to be in satisfactory condition. The motors were not leaking, as well.

PHOTOGRAPH NO. 3

AOC NUMBER: 4

AOC NAME: Scrap Area No. 2

AOC DESCRIPTION: Concrete-decked area behind the northwest portion of the plant building. The approximate 10' x 30' area is used to store abandoned steel cabinets, metal racks, machinery, and fabrication equipment. A small amount of the scrap was on a grassed portion of the area during the inspection.

DATE OF START-UP: According to Eaton Corporation personnel, the scrap was placed in this location during July of 1989.

DATE OF CLOSURE: The area was active during the VSI.

WASTES MANAGED: Abandoned or scrap cabinets, metal racks, or machinery.

RELEASE CONTROLS: There were no release controls for this area.

RELEASE HISTORY: According to Eaton Corporation personnel, there have never been any releases from this area (Ref. 1, p. 13).

INTERIM RECOMMENDATIONS: No Further Action. The concrete and grassed area appeared to be in satisfactory condition. There were no releases seen during the inspection.

PHOTOGRAPH NO. 4

SWMU NUMBER: 5

SWMU NAME: Drum Storage Area

SWMU DESCRIPTION: This unit is located inside one of two storage sheds located in the northwest portion of the facility property. The corrugated steel shed is about 25' x 70' and has a concrete floor but no diking or other means of containment. During the inspection, forty-eight 55-gallon drums were stored in the shed. Among the 48 drums were, four full drums of hydrochloric acid, three full drums of nitric acid, and about seven drums of sulfuric acid. The remainder of the drums were empty, except for a few partially full drums of toluene. According to Eaton Corporation personnel, all the drums were supposed to be empty and awaiting pickup by Eaton's supplier, PB and S Chemical of Bowling Green. Pickups of empty drums are once per week for reuse with new product.

DATE OF START-UP: According to Eaton Corporation personnel, this unit is believed to have been placed in service in 1981.

DATE OF CLOSURE: This unit was active during the VSI.

WASTES MANAGED: The empty, partial, or full drums contained acids, solvents, and paints and are stored in this unit until Eaton's supplier picks them up. The full drums appear to be new product, which is awaiting transfer to the raw product storage area of the plant.

RELEASE CONTROLS: There were no release controls other than the concrete deck which supports the shed.

RELEASE HISTORY: According to Eaton Corporation personnel, there have never been any releases from this unit (Ref. 1, p. 13).

INTERIM

RECOMMENDATIONS: Further Assessment: Low priority. The full drums should be transferred to the storage area, and partial/used drums should be transferred to the hazardous waste drum storage area (SWMU No. 17). Containment is required for storage areas of drums.

PHOTOGRAPH NO. 5

SWMU NUMBER: 6

SWMU NAME: Roll on/Roll off Dumpster

SWMU DESCRIPTION: A concrete-decked area is located in the northwest portion of the facility property and is used for the dumpster. This 20-cubic-yard dumpster is used to dispose of wood pallets. Disposal or recycling of waste is conducted by Monarch Environmental located in Bowling Green, Kentucky. Disposal practices by Monarch Environmental are unknown according to Eaton Corporation personnel. Pickups of the dumpster are twice weekly (Refs. 1, p. 13; 22).

DATE OF START-UP: According to Eaton Corporation personnel, this unit is believed to have been placed in service in 1965.

DATE OF CLOSURE: This unit was active during the VSI.

WASTES MANAGED: This dumpster is used to dispose of or recycle scrap wooden pallets.

RELEASE CONTROLS: There are no release controls other than the concrete deck which supports the dumpster.

RELEASE HISTORY: According to Eaton Corporation personnel, there have been no releases from this unit (Refs. 1, p. 13; 5).

INTERIM RECOMMENDATIONS: No Further Action. The dumpster appeared to be in satisfactory condition. No releases were seen during the inspection.

PHOTOGRAPH NO. 6

SWMU NUMBER: 7

SWMU NAME: Roll on/Roll off Dumpster

SWMU DESCRIPTION: A concrete-decked area is located in the northwest portion of the facility property and is used for the dumpster. This 20-cubic-yard dumpster is used to dispose of common steel scrap. Disposal and recycling of scrap steel waste is conducted by Klempner Brothers located in Louisville, Kentucky. Pickups of the dumpster are approximately once every 1 to 2 weeks (Refs. 1, p. 13; 22).

DATE OF START-UP: According to Eaton Corporation personnel, this unit is believed to have been placed in service in 1965.

DATE OF CLOSURE: This unit was active during the VSI.

WASTES MANAGED: This dumpster is used to dispose of and recycle common steel scrap

RELEASE CONTROLS: There are no release controls other than the concrete deck which supports the dumpster.

RELEASE HISTORY: According to Eaton Corporation personnel, there have been no releases from this unit (Refs. 1, p. 13; 5).

INTERIM RECOMMENDATIONS: No Further Action. The dumpster appeared to be in satisfactory condition. No releases were seen during the inspection.

PHOTOGRAPH NO. 7

SWMU NUMBER: 8

SWMU NAME: Roll on/Roll off Dumpster

SWMU DESCRIPTION: A concrete-decked area is located in the northwest portion of the facility property and is used for the dumpster. This 20-cubic-yard dumpster is used to dispose of mixed steel scrap. Disposal and recycling of scrap steel waste is conducted by Klempner Brothers located in Louisville, Kentucky. Pickups of the dumpsters are approximately once every 1 to 2 weeks (Refs. 1, p. 13; 22).

DATE OF START-UP: According to Eaton Corporation personnel, this unit is believed to have been placed in service in 1965.

DATE OF CLOSURE: This unit was active during the VSI.

WASTES MANAGED: This dumpster is used to dispose of and recycle mixed steel scrap.

RELEASE CONTROLS: There are no release controls other than the concrete deck which supports the dumpster.

RELEASE HISTORY: According to Eaton Corporation personnel, there have been no releases from this unit (Refs. 1, p. 13; 5).

INTERIM RECOMMENDATIONS: No Further Action. The dumpster appeared to be in satisfactory condition. No releases were seen during the inspection.

PHOTOGRAPH NO. 8

SWMU NUMBER: 9

SWMU NAME: Roll on/Roll off Dumpster

SWMU DESCRIPTION: A concrete-decked area is located in the northwest portion of the facility property and is used for the dumpster. This 20-cubic-yard dumpster is used to dispose of stainless steel scrap. Disposal and recycling of steel scrap waste is conducted by Klempner Brothers located in Louisville, Kentucky. Pickups of the dumpster are approximately once every 1 to 2 weeks (Refs. 1, p. 13; 22).

DATE OF START-UP: According to Eaton Corporation personnel, this unit is believed to have been placed in service in 1965.

DATE OF CLOSURE: This unit was active during the VSI.

WASTES MANAGED: This dumpster is used to dispose of and recycle stainless steel.

RELEASE CONTROLS: There are no release controls other than the concrete deck which supports the dumpster.

RELEASE HISTORY: According to Eaton Corporation personnel, there have been no releases from this unit (Refs. 1, p. 13; 5).

INTERIM RECOMMENDATIONS: No Further Action. The dumpster appeared to be in satisfactory condition. No releases were seen during the inspection.

PHOTOGRAPH NO. 9

SWMU NUMBER: 10

SWMU NAME: Roll on/Roll off Dumpster

SWMU DESCRIPTION: This dumpster receives the dewatered electroplating sludge cake which is pressed at the Phase II wastewater treatment area (SWMU No. 16) (Ref. 1, p. 13). The dewatered sludge is transported to the dumpster daily with a forklift and small containers or mini-dumpsters (Ref. 22). The capacity of the dumpster is 20 cubic yards. Before the dumpster was placed in service, the dewatered sludge cake was disposed of in flexbins. When the flexbins were used, Chemical Waste Management disposed of the sludge in Fort Wayne, Indiana. Pickups of the dumpster are every 75 to 85 days (Refs. 1, p. 13; 22).

DATE OF START-UP: The dumpster was placed in service on June 15, 1989. Prior to this, flexbins were used.

DATE OF CLOSURE: This unit was active during the VSI.

WASTES MANAGED: This dumpster stores F006 electroplating sludge. Approximately 30,000 pounds per quarter of sludge are picked up by Heritage Environmental for disposal in a Indianapolis, Indiana hazardous waste disposal facility.

RELEASE CONTROLS: The dumpster rests on a concrete deck under a shelter to prevent rainwater inundation. The dumpster has a polyvinyl liner, and a tarp is placed over the top of the dumpster and its contents.

RELEASE HISTORY: According to Eaton Corporation personnel, there have been no releases from this unit (Ref. 1, p. 13).

INTERIM RECOMMENDATIONS: No Further Action. The concrete deck and dumpster appeared to be in satisfactory condition during the inspection.

PHOTOGRAPH NO. 10

SWMU NUMBER: 11

SWMU NAME: Plating Bath Line

SWMU DESCRIPTION: Some metal parts to be fabricated into electric motor control units are electroplated in this line of about 32 tanks. The 50- to 80-gallon tanks are constructed of polypropylene.

DATE OF START-UP: According to Eaton Corporation personnel, this unit is believed to have been placed in service in 1980.

DATE OF CLOSURE: This unit was active during the VSI.

WASTES MANAGED: This plating bath line consists of alkaline baths, rinsewater baths, nitric, sulfuric, and hydrochloric acid washes, zinc, copper, nickel, and tin plating baths and sodium dichromate baths. Only potential spills would be considered waste.

RELEASE CONTROLS: The entire bath line is surrounded by a containment sump formed into the concrete foundation. The floor around the baths and above the sump area is covered with steel grating. The containment sump has an automatic floor flush system activated three times per day. The bottom of the sump, is sloped toward the Phase I wastewater treatment plant (SWMU No. 15) (Ref. 1, p. 13; 21)

RELEASE HISTORY: According to Eaton Corporation personnel, there have never been any releases from this unit (Ref. 1, p. 13).

INTERIM RECOMMENDATIONS: No Further Action. The unit and containment sump appeared to be in satisfactory condition during the VSI.

PHOTOGRAPH NO. 11

SWMU NUMBER: 12

SWMU NAME: Plating Barrel Line

SWMU DESCRIPTION: Some metal parts to be fabricated into electric motor control units are electroplated in this line of about 32 tanks. The approximate 250-gallon tanks are constructed of steel and fiberglass with PVC liners.

DATE OF START-UP: According to Eaton Corporation personnel, this unit is believed to have been placed in service in 1972.

DATE OF CLOSURE: This unit was active during the VSI.

WASTES MANAGED: This plating bath line consists of alkaline baths, rinsewater baths, nitric, and hydrochloric acid washes, zinc, copper, nickel, and tin plating baths, and sodium dichromate baths. Only potential spills would be considered waste.

RELEASE CONTROLS: The entire bath line is surrounded by a containment sump formed into the concrete foundation. The floor around the baths and above the sump area is covered with steel grating. The containment sump has an automatic floor flush system activated three times per day. The bottom of the sump is sloped toward the Phase I wastewater treatment plant (Refs. 1, p. 13; 21).

RELEASE HISTORY: According to Eaton Corporation personnel, there have never been any releases from this unit (Ref. 1, p. 13).

INTERIM RECOMMENDATIONS: No Further Action. The unit and containment sump appeared to be in satisfactory condition during the VSI.

PHOTOGRAPH NO. 12

SWMU NUMBER: 13

SWMU NAME: Automatic Zinc Plating Unit

SWMU DESCRIPTION: Some metal parts to be fabricated into electric motor control units area also electroplated in this unit comprised of 33 tank stations. The stations are constructed of stainless steel with fiberglass coating and lined with polyvinyl chloride (PVC).

DATE OF START-UP: According to Eaton Corporation personnel, this unit is believed to have been placed in service in 1985.

DATE OF CLOSURE: This unit was active during the VSI.

WASTES MANAGED: This electroplating automatic plating bath unit consists of alkaline baths, soap cleaners, rinsewater baths, nitric acid dip, hydrochloric acid pickle, zinc plating baths, and sodium dichromate baths. Only potential spills would be considered waste.

RELEASE CONTROLS: The entire unit is surrounded by a containment sump formed into the concrete foundation. The floor around the baths and above the sump is covered with steel grating. The containment sump has an automatic floor flush system activated three times per day. The bottom of the sump is sloped toward the Phase I wastewater treatment plant (Refs. 1, p. 13; 21)

RELEASE HISTORY: According to Eaton Corporation personnel, there have never been any releases from this unit (Ref. 1, p. 13).

INTERIM RECOMMENDATIONS: No Further Action. The unit and containment sump appeared to be in satisfactory condition during the VSI.

PHOTOGRAPH NO. 13

SWMU NUMBER: 14

SWMU NAME: Paint Booth

SWMU DESCRIPTION: The paint booth is located just west of the electroplating area. It is used to paint the devices produced by Eaton Corporation. Airless equipment is used to propel the paint, and the finished product is allowed to air-dry. Filters in the unit are changed when necessary and disposed of in drums. The drums are stored at the drum storage area (SWMU No. 17). Monarch Sanitary picks up the drums and disposes them at the Butler County Landfill.

DATE OF START-UP: According to Eaton Corporation personnel, this unit is believed to have been placed in service in 1965.

DATE OF CLOSURE: This unit was active during the VSI.

WASTES MANAGED: The paint and related vapors are nonhazardous. The booth is permitted (No. 0-79-428) for air emissions.

RELEASE CONTROLS: The booth is vented from above. The vent has filters to contain most of the vapor emissions.

RELEASE HISTORY: According to Eaton Corporation personnel, there have never been any releases from this unit (Refs. 1, p. 13; 5)

INTERIM RECOMMENDATIONS: No Further Action. There was no evidence of releases during the VSI.

PHOTOGRAPH NO. 14

SWMU NUMBER: 15

SWMU NAME: Phase I Wastewater Treatment Plant

SWMU DESCRIPTION: The Phase I wastewater treatment area is sandwiched between the electroplating area and the painting area in the northwest portion of the facility. The area is comprised of about 40 fiberglass tanks varying in capacity from between 250 to 3500 gallons. Wastewater generated as a result of plating, metal finishing, and solvent cleaning enters the treatment area via the floor drainage system (SWMU Nos. 11, 12 and 13) and flows into five sumps. The five sumps are for floor spill, reuse water, chrome waste, continuous floor wash, and silver cyanide waste. These wastes are pumped to the treatment tanks where treatment consists of adding lime, sodium hydroxide, chlorine, sulfuric acid, and "alumafloc" for clarification. The treated wastewater, after going through processing in the unit, is then sent to Phase II of wastewater treatment (SWMU No. 16). Prior to the installation of Phase II, the effluent was discharged to the formerly used surface impoundments (SWMU No. 1) (Refs. 1, p. 13; 22).

DATE OF START-UP: According to Eaton Corporation personnel, this unit is believed to have been placed in service in 1976. Wastewater treatment prior to 1976 in unknown.

DATE OF CLOSURE: This unit was active during the VSI.

WASTES MANAGED: This unit receives wastewaters consisting of floor spill, reuse water, silver cyanide, chromium, and continuous containment floor wash.

RELEASE CONTROLS: The treatment tanks have high level alarms and pH alarms to alert plant personnel of malfunctions.

RELEASE HISTORY: According to Eaton Corporation personnel, there have never been any releases from this unit (Ref. 1, p. 13).

INTERIM RECOMMENDATIONS: No Further Action. There was no evidence of releases during the VSI.

PHOTOGRAPH NO. 15

SWMU NUMBER: 16

SWMU NAME: Phase II Wastewater Treatment Plant

SWMU DESCRIPTION: The Phase II wastewater treatment area is located in the northwest corner of the plant. The area is comprised of about ten fiberglass tanks varying in capacity from between 200 and 2000 gallons. The clarifier tank holds 10,000 gallons. Treated wastewater from Phase I (SWMU No. 15) is pumped to this area. It is neutralized with lime and sodium hydroxide. A flocculant is added to settle out any remaining solids. The effluent is then sent to the clarifier tank before being discharged to the municipal sewer system (Permit No. P010) (Refs. 1, p. 13; 5). Decant tanks in the Phase II area receive acid waste and floor spill from the Phase I area for settlement. The treated effluent from these decant tanks is discharged to the municipal sewer system, as well. Sludges are filter pressed to dewater the F006 sludge which results. The water pressed out is recycled back to the acid waste decant tanks. The F006 sludge is disposed in a dumpster (SWMU No. 10) (Refs. 1, p. 13; 23).

DATE OF START-UP: According to Eaton Corporation personnel, this unit is believed to have been placed in service in 1981.

DATE OF CLOSURE: This unit was active during the VSI.

WASTES MANAGED: Treated wastewaters from Phase I (SWMU No. 15) are further treated at this unit. A resulting sludge, designated as F006 electroplating sludge, is generated.

RELEASE CONTROLS: The treatment tanks have high level alarms and pH alarms to alert plant personnel of malfunctions.

RELEASE HISTORY: According to Eaton Corporation personnel, there have never been any releases from this unit (Ref. 1, p. 13).

INTERIM RECOMMENDATIONS: No Further Action. There was no evidence of releases from this unit during the VSI.

PHOTOGRAPH NO. 16

SWMU NUMBER: 17

SWMU NAME: Hazardous Waste Drum Storage Area

SWMU DESCRIPTION: This 60' x 12' area located just south of the painting area is used to store 55-gallon drums of hazardous and nonhazardous waste. The area was surrounded by a 4" x 6" reinforced concrete dike; however, there was no containment sump. The approximate 22 drums were all stored on pallets during the VSI. The concrete floor within the storage area was epoxy-sealed to resist acid or caustic spills. The drums of waste are shipped by Heritage Transport, Inc. to the Heritage Environmental Services Facility in Indianapolis, Indiana.

DATE OF START-UP: According to Eaton Corporation personnel, this unit is believed to have been placed in service in 1989. Prior to this, the area was contained with steel angles and silicon sealant.

DATE OF CLOSURE: This unit was active during the VSI.

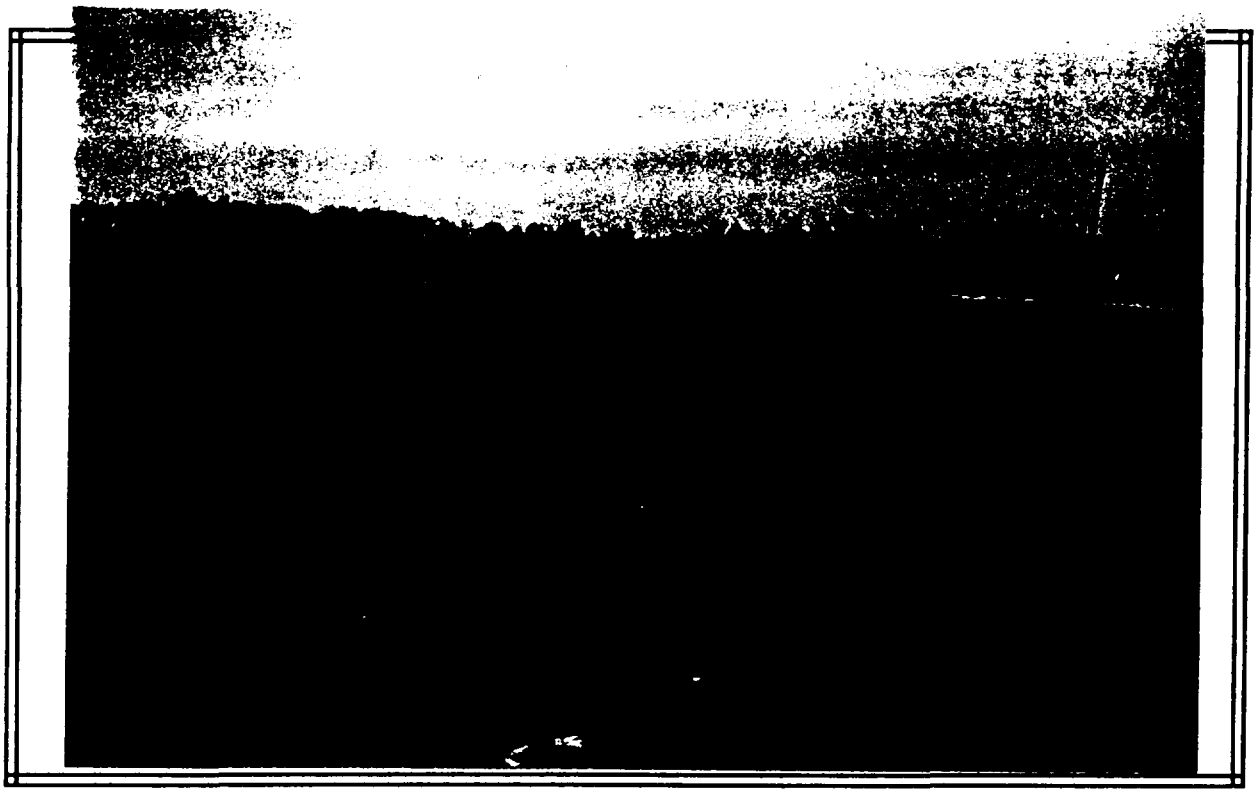
WASTES MANAGED: During the VSI, the drums stored in the storage area contained either nonhazardous paint waste, lubricating oil, F003 and F005 mixed waste, F001 waste, freon waste, 1,1,1-trichloroethane, nickel waste, or F006 sludge.

RELEASE CONTROLS: The concrete deck is epoxy-coated to resist acid or caustic corrosion. The area is contained by a 4" x 6" reinforced concrete dike.

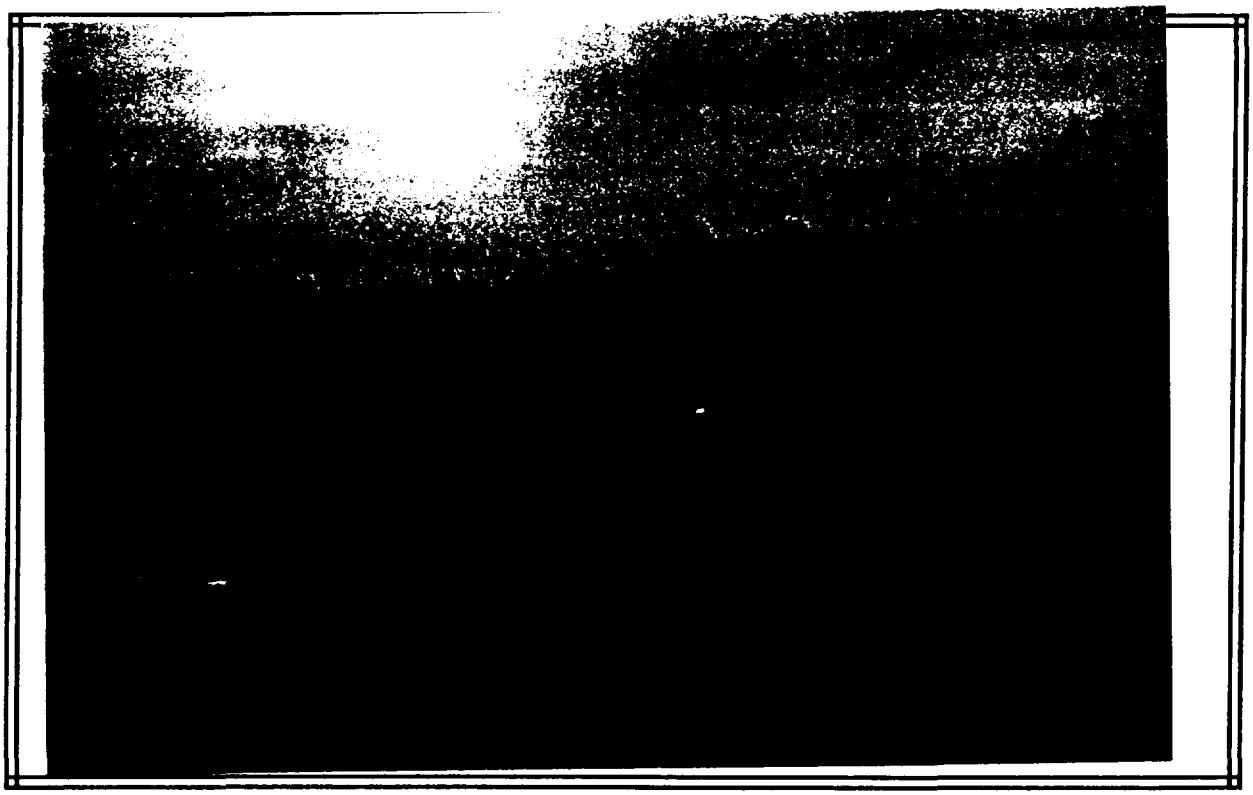
RELEASE HISTORY: According to Eaton Corporation personnel, there have never been any releases from this unit (Refs. 1, p. 13; 5).

INTERIM RECOMMENDATIONS: No Further Action. There was no evidence of releases from this unit during the VSI. The concrete deck and diking appeared to be in satisfactory condition.

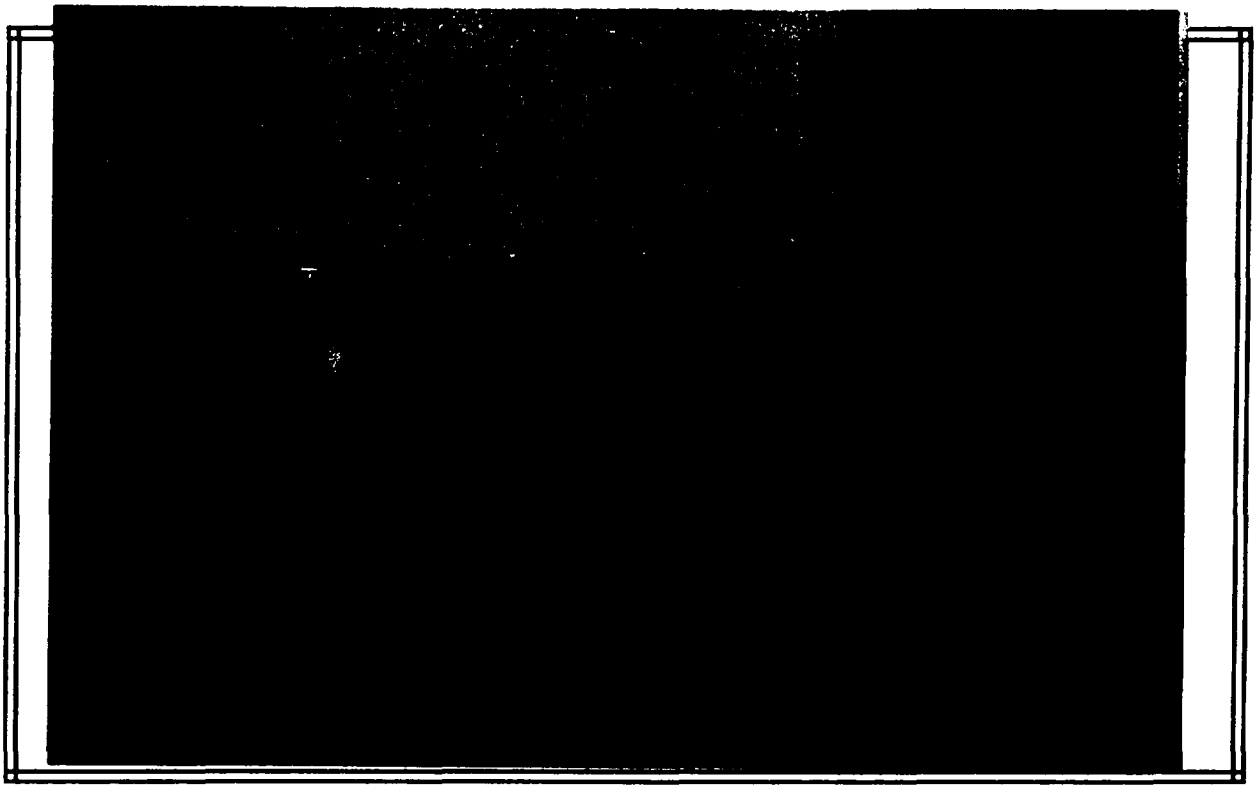
PHOTOGRAPH NO. 17



Photograph No. 1A (SWMU No. 1) Easternmost panoramic photo of the former location of the settlement and sludge drying impoundments.

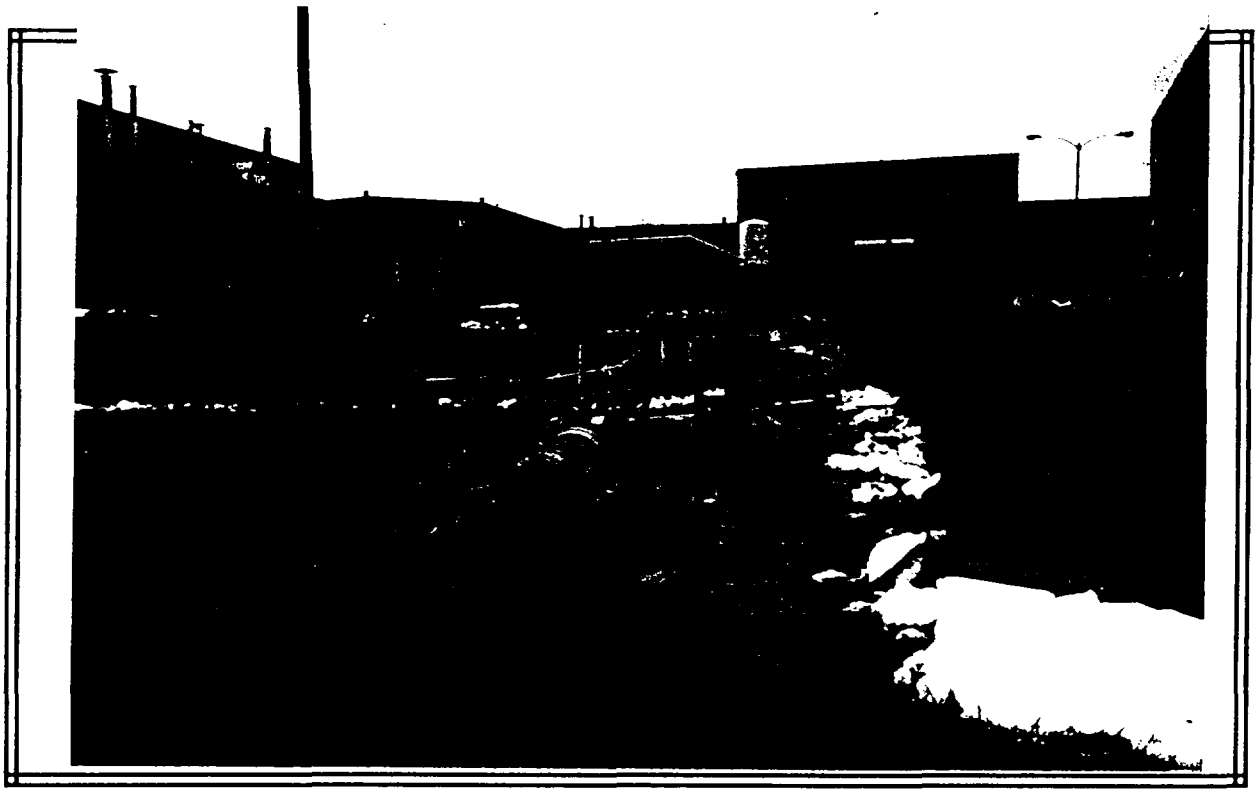


Photograph No. 1B (SWMU No. 1) Northernmost panoramic photo of the former location of the settlement and sludge drying impoundments.

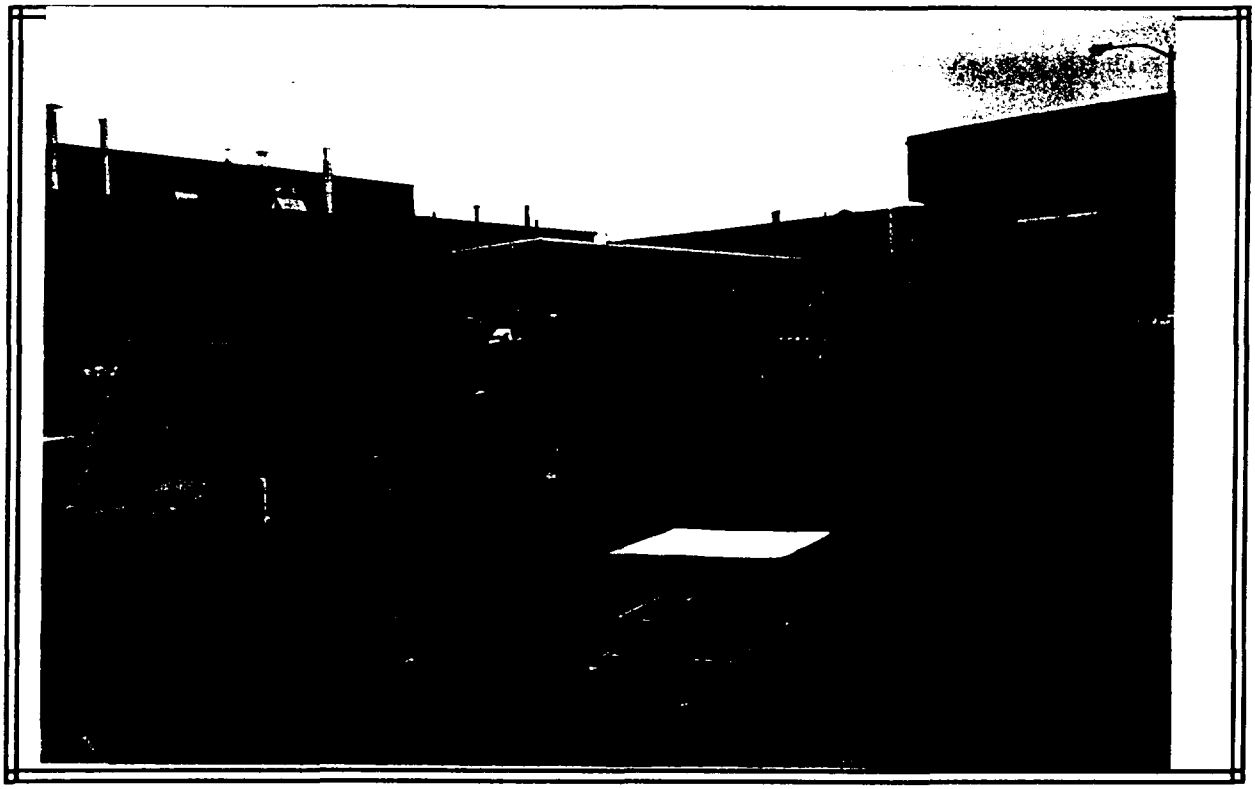


Photograph No. 1C (SWMU No. 1) Westernmost panoramic photo of the former location of the settlement and sludge drying impoundments.

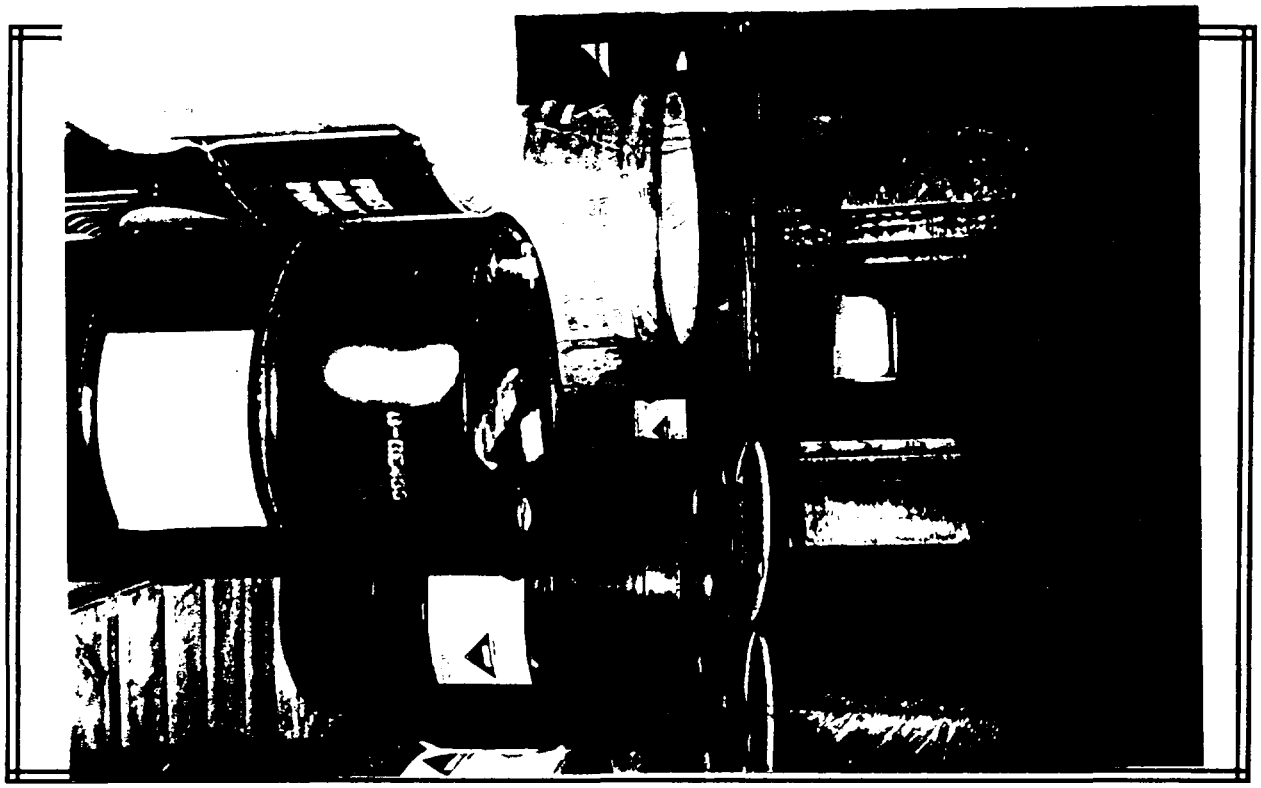
Photograph No. 2 (SWMU No. 2) Photograph of the discharge sinkhole through the northwest fence. The area appeared swampy, rather than clearly defined.



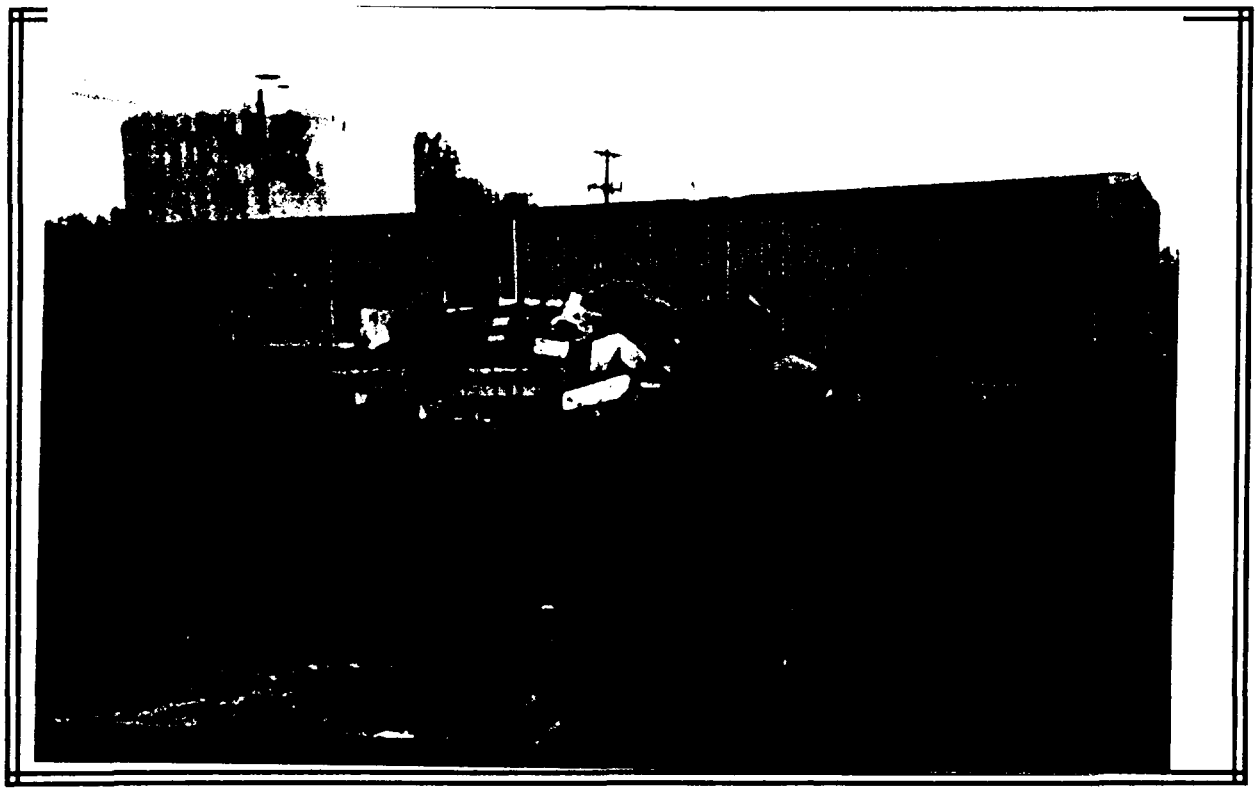
Photograph No. 3 (AOC No. 3) Sealed or dry motors and steel racks stored mostly on grass.



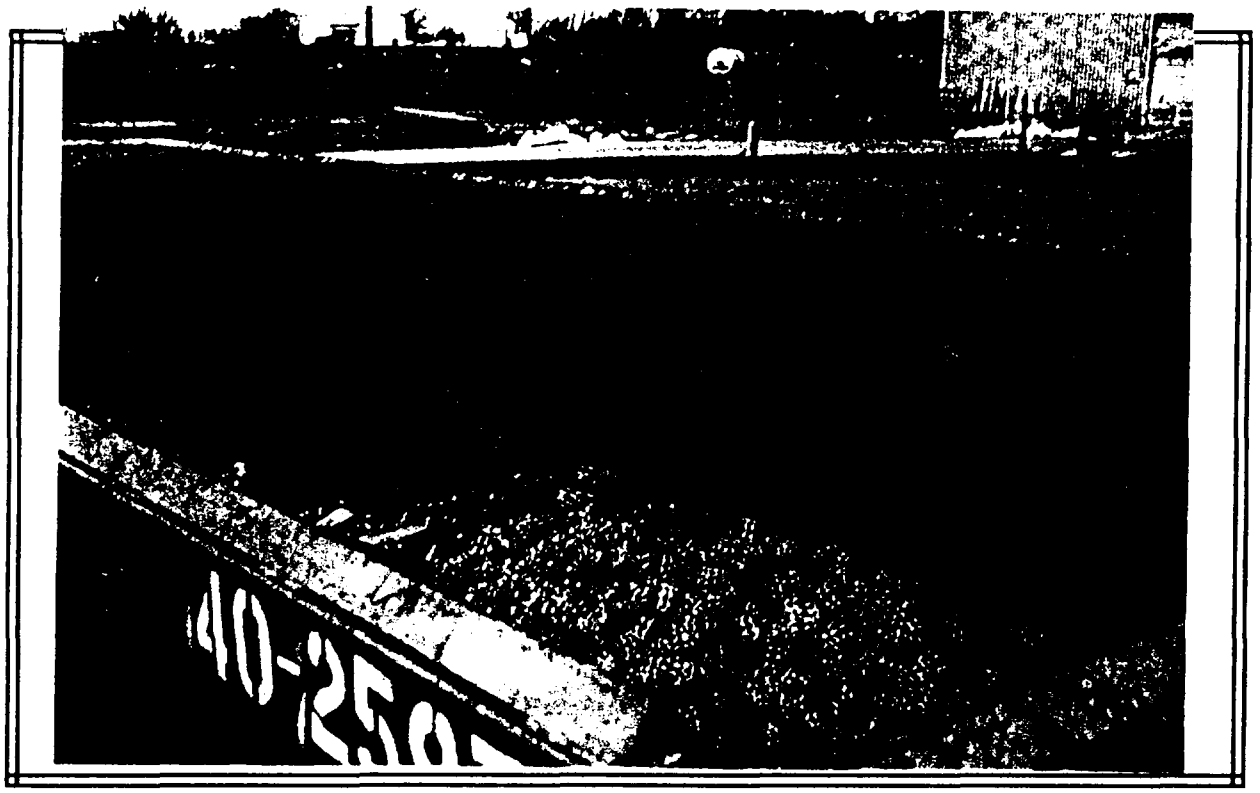
Photograph No. 4 (SWMU No. 4) Various metal scrap, wooden pallets, and abandoned equipment.



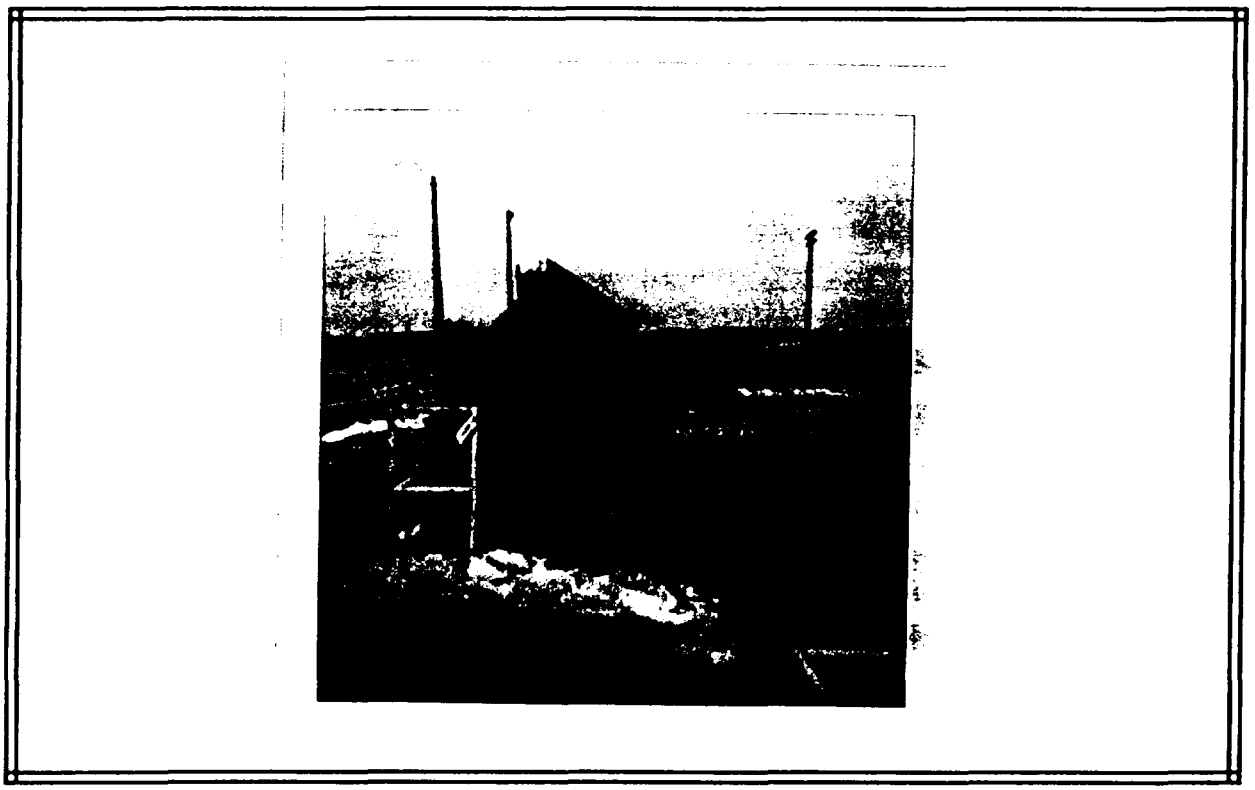
Photograph No. 5 (SWMU No. 5) View inside of one of the storage sheds. Most of the drums were empty; however, several were either full or partially full.



Photograph No. 6 (SWMU No. 6) Dumpster used to dispose of wooden pallets.

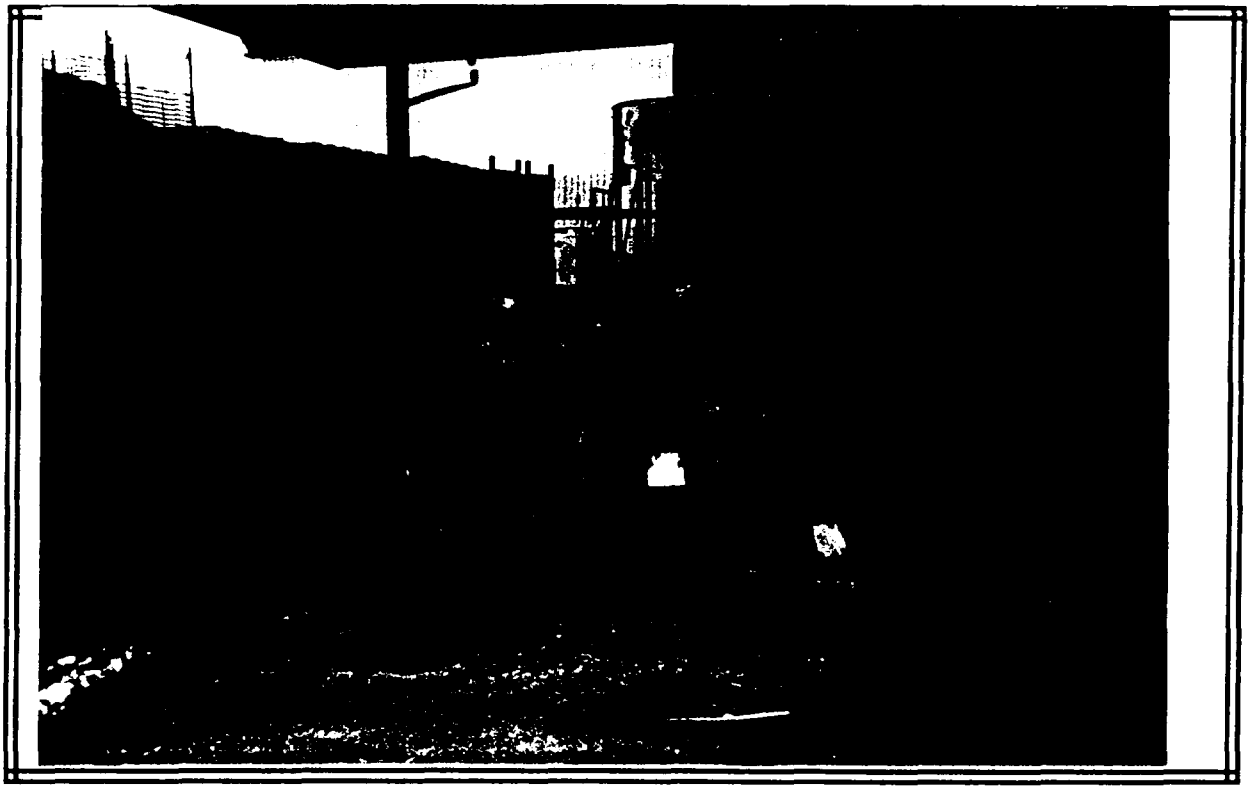


Photograph No. 7 (SWMU No. 7) Dumpster used to dispose of common steel scrap.

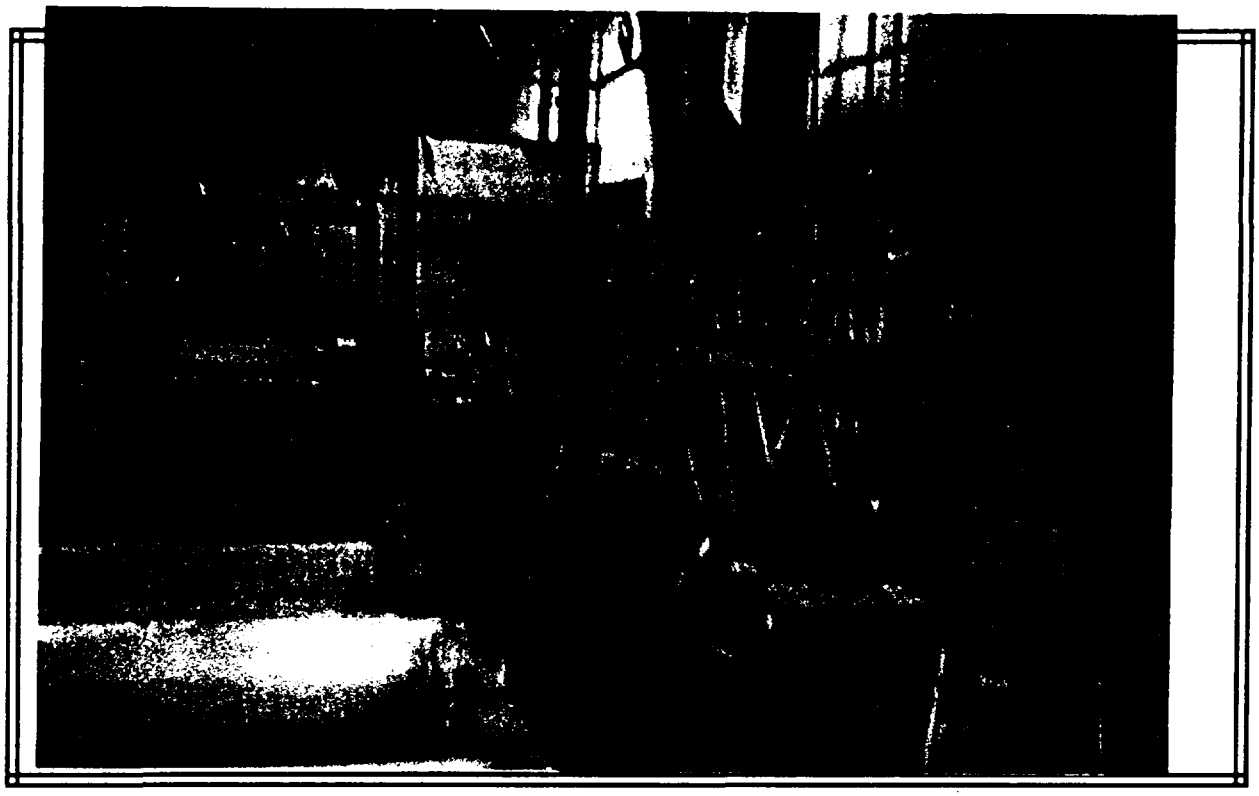


Photograph No. 8 (SWMU No. 8) Dumpster used to dispose of mixed steel scrap.

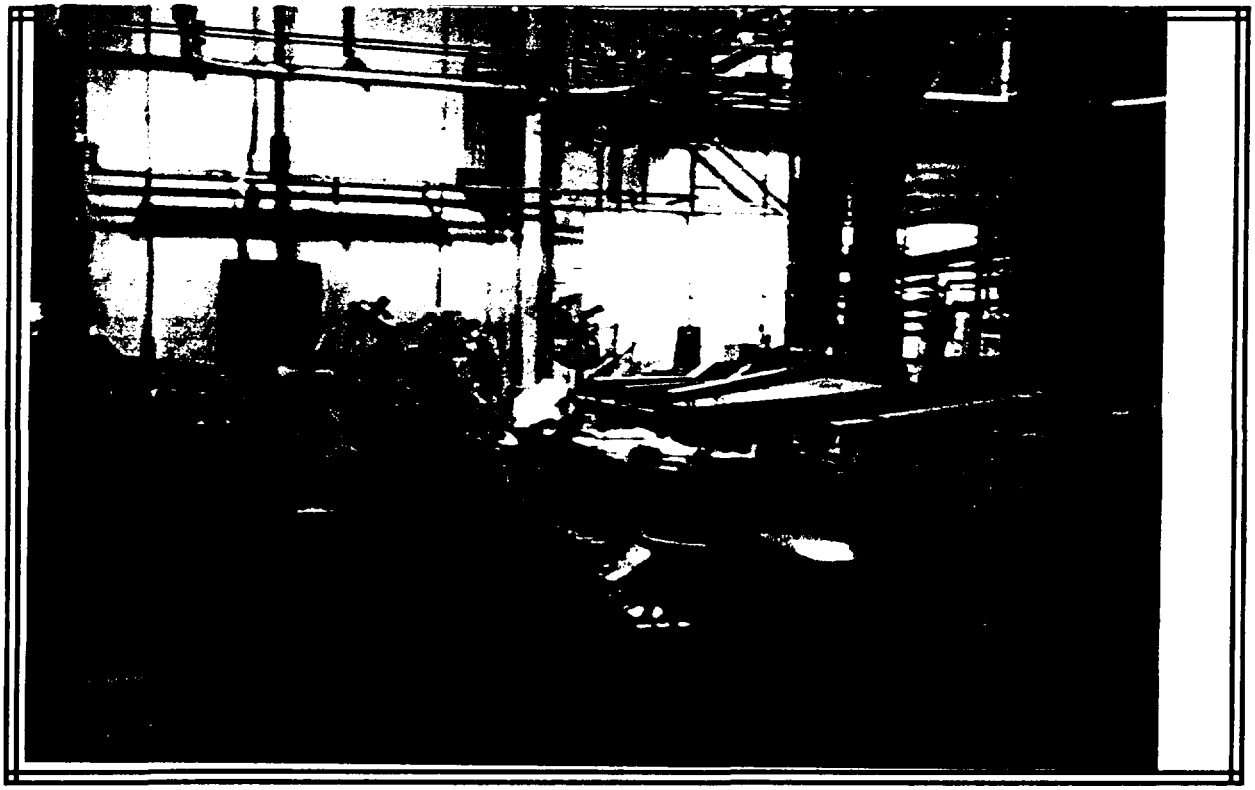
Photograph No. 9 (SWMU No. 9) Dumpster used to dispose of stainless steel scrap.



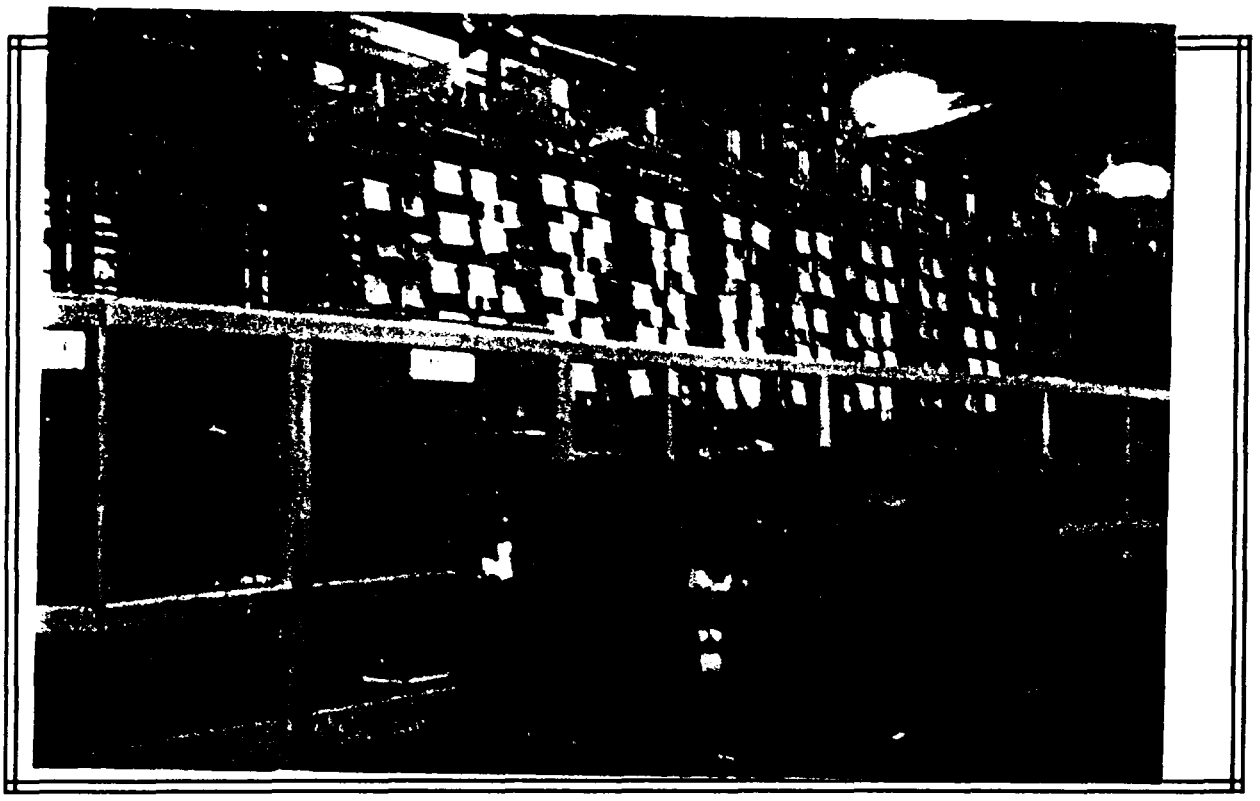
Photograph No. 10 (SWMU No. 10) Dumpster used to dispose of F006 electroplating sludge.



Photograph No. 11 (SWMU No. 11) Electroplating line where some metal parts are plated prior to assembly.



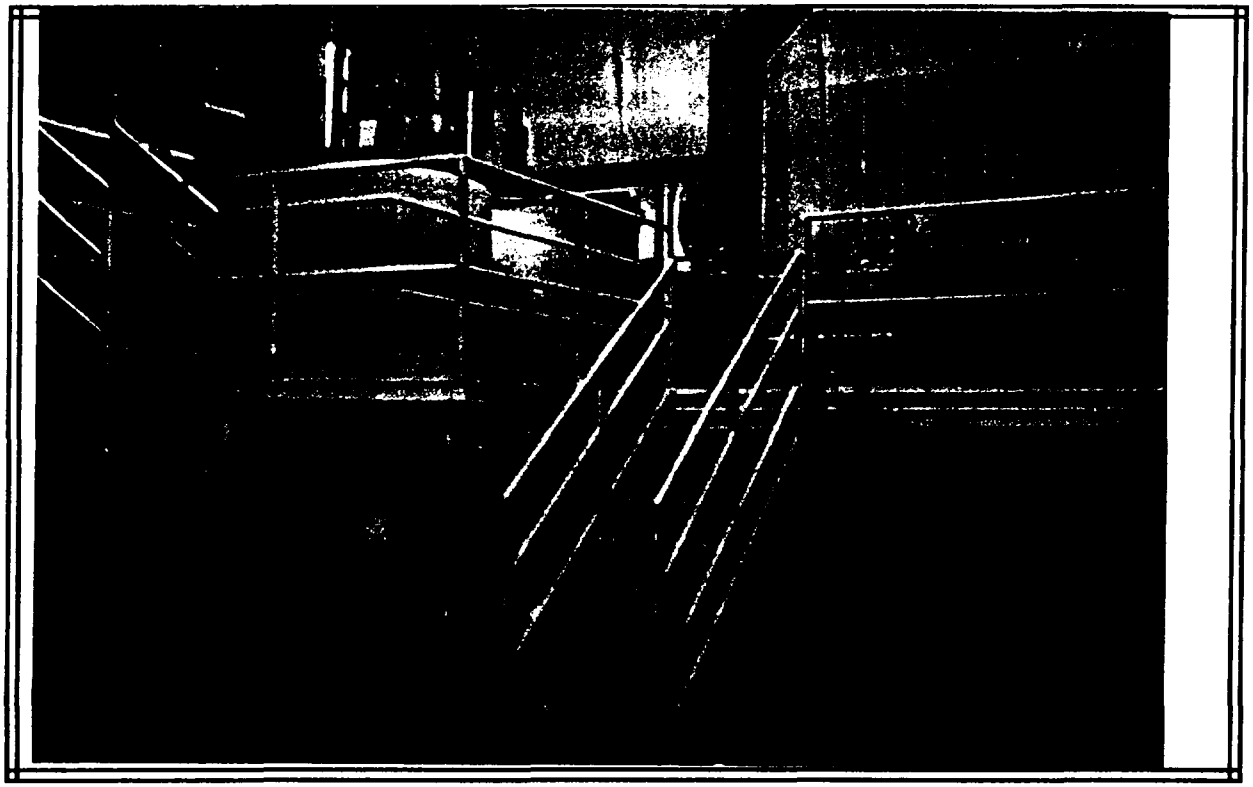
Photograph No. 12 (SWMU No. 12) Plating barrel line used to plate some metal parts prior to assembly.



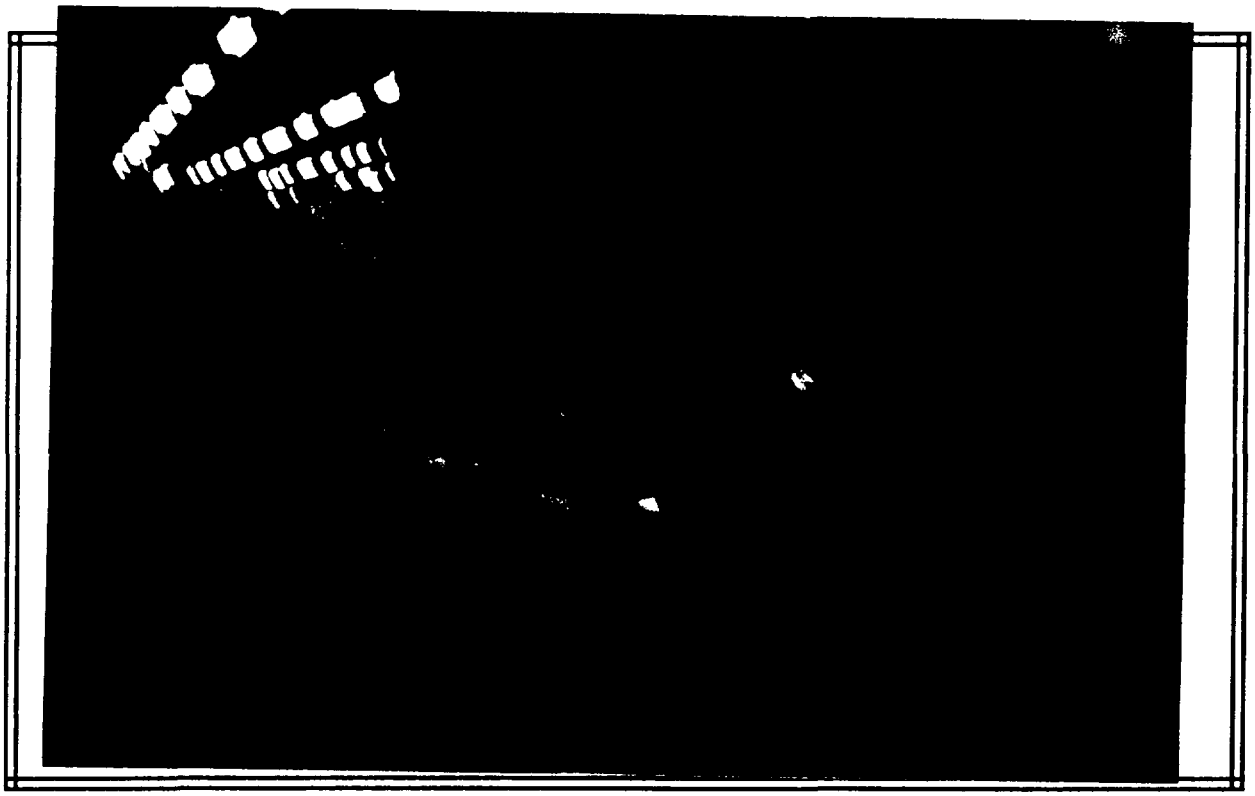
Photograph No. 13 (SWMU No. 13) Auto-zinc plating unit used to plate some metal parts prior to assembly.

Photograph No. 14 (SWMU No. 14) Paint booth used to airlessly paint devices as part of final production.

Photograph No. 15 (SWMU No. 15) View of the Phase I Wastewater Treatment Plant.



Photograph No. 16 (SWMU No. 16) View of the Phase II Wastewater Treatment Plant.



Photograph No. 17 (SWMU No. 17) Hazardous and nonhazardous waste drum storage area. Note 4" x 6" diking and drums on pallets.

REFERENCES

1. NUS Corporation Field Logbook No. F4-1896 for Eaton Corporation, TDD No. F4-8910-22. Documentation of Visual Site Inspection and offsite reconnaissance, December 11, 1989.

2. Plant plan layout for the Eaton Corporation, Bowling Green Kentucky; obtained from Steve Fesko, principal engineer, Eaton Corporation, December 11, 1989. No scale.

3. Site plan layout for Cutler-Hammer, Inc., Bowling Green Kentucky (Eaton Corporation), 1973; obtained from Steve Fesko, principal engineer, Eaton Corporation, December 11, 1989. Scale: 1 in = 100 ft ±.

4. Barry Burrus, Chief, Uncontrolled Sites Section, Kentucky Division of Waste Management, memorandum to Caroline P. Haight, Manager, Permit Review Branch, Kentucky Division of Waste Management, March 21, 1984. Subject: Uncontrolled site closure for Eaton Corporation.

5. Steve Fesko, Principal Engineer, Eaton Corporation, letter to Mitch Cohen, NUS Corporation, January 3, 1990. Subject: Information regarding Eaton Corporations, Bowling Green facility.

6. Roland McAbee, Manufacturing Services Manager, Eaton Corporation, memorandum to Mitch Cohen, NUS Corporation, December 11, 1989. Subject: Eaton Corporation's, nature of operations.

7. Alliance Technologies Corporation, "Inspection to assess compliance with closure/post-closure requirements at Eaton Corporation Bowling Green, Kentucky KYD098950306," Draft Final Report, prepared for the Office of Waste Programs Enforcement of the EPA (April 1987).

8. Mohammed Alauddin, RCRA Section, Kentucky Division of Waste Management, telephone conversation with Mitch Cohen, NUS Corporation, January 3, 1990. Subject: RCRA history for Eaton Corporation.

9. J. Alex Barber, Kentucky Division of Waste Management, letter to Mr. H. Kitscha, Vice President, Eaton Corporation, December 11, 1984. Subject: Actual closure of Hazardous Waste Facility KYD098950306.

10. Jack Watkins, Kentucky Division of Waste Management, telephone conversation with Mitch Cohen, NUS Corporation, December 18, 1989. Subject: Current RCRA status of Eaton Corporation, Bowling Green, Kentucky.

11. Nicholas Crawford, Ph.D, Dye Traces of Loading Ramp Drainage Well and Paint Vats at D.E.S.A. Corporation, Industrial Drive, Bowling Green, Kentucky, Submitted to Kentucky Dept. of Natural Resources and Environment Protection Cabinet and the U.S. EPA, September 17, 1985.

12. T. Wm. Lambert, Water in a Limestone Terrain in the Bowling Green Area, Warren County, Kentucky, Report of Investigations 17 (University of Kentucky, Lexington: U.S. Geological Survey, 1976), pp. 2, 3, 18-26, plates 1 and 3.

13. U.S. Dept. of Commerce, Climatic Atlas of the United States (Washington D.C.: GPO, June 1968) Reprint: 1983, National Oceanic and Atmospheric Administration, pp. 43, 63.

14. U.S. Dept. of Agriculture, Rainfall Frequency Atlas of the United States, Technical paper No. 40 (Washington, D.C.: GPO, 1961), p. 93.

15. Nicholas C. Crawford, Christopher G. Groves, Thomas P. Feeney, and Benjamin J. Keller, Agriculture and Urban Nonpoint Source Pollution Impacts on Karst Aquifers in the Pennyroyal Karst Region of Kentucky, Part 1, Hydrogeology of the Lost River Karst Groundwater Basin, Warren County, Kentucky (Western Kentucky University: Bowling Green, Kentucky, 1987). pp. 16-20, 28, plate 3.

16. NUS Corporation Field Logbook No. F4-1191 of Colt Industries, Holley Carburetor Division Plant No. 7, TDD No. F4-8806-11. Documentation of screening site inspection, January 10-12, 1989.

17. R.F. Brown and T.W. Lambert, Availability of Ground Water in Allen, Barren, Edmonson, Green, Hart, Logan, Metcalfe, Monroe, Simpson, and Warren Counties, Kentucky, Hydrologic Investigations Atlas HA-32 (Washington, D.C.: U.S. Geological Survey, 1962). Sheet 3 of 3.

18. John McGregor, Kentucky Fish and Wildlife Service, telephone conversation with Belinda Brock, NUS Corporation, March 1, 1988. Subject: Critical habitats in Warren County.

19. U.S. Fish and Wildlife Service, Endangered and Threatened Species of the Southeastern United States, (Atlanta, Georgia: 1988).

20. Benjy Kinman, Kentucky Department of Fish and Wildlife, Fisheries Division, telephone conversation with Eric Corbin, NUS Corporation, December 3, 1987. Subject: Recreational use of the Barren River.

21. Wayne Garfinkel, Chief, Kentucky/Tennessee Unit, Waste Engineering Section, EPA, letter to Susan Deihl, Chief, North Unit, Site Assessment Branch, EPA, December 2, 1988. Subject: Inspection to assess compliance with closure/post-closure requirements report, Eaton Corporation, KYD098950306.

22. Roland McAbee, Manufacturing Services Manager, Eaton Corporation, letter to Mitch Cohen, NUS Corporation, January 24, 1990. Subject: Waste disposal activities at Eaton Corporation.

DYE TRACES OF LOADING RAMP DRAINAGE WELL AND PAINT VATS AT D.E.S.A. CORPORATION, INDUSTRIAL DRIVE, BOWLING GREEN, KENTUCKY

Report Submitted to:

Robert Adams IV
Kentucky Division of Water
Natural Resources and Environmental Protection Cabinet

and

Chris Leggett
Operations
Haztech

and

Fred Stroud III
Emergency Response and Control Section
U.S. Environmental Protection Agency
Region IV

By

Nicholas Crawford, Ph.D.
Hydrology Consultant

September 17, 1985

DYE TRACES OF LOADING RAMP DRAINAGE WELL AND PAINT VATS AT D.E.S.A. CORPORATION, INDUSTRIAL DRIVE, BOWLING GREEN, KENTUCKY

DESA LOADING RAMP DRAINAGE WELL DYE TRACE

On March 21, 1985 at 9:12 AM, two liters of Rhodamine WT (20% solution) dye were injected into the DESA loading ramp drainage well and flushed with 23,000 gallons of water. The drainage well, located on the south loading ramp, receives storm water runoff from a nearby roof downspout and from an excavated approach to the loading ramp. In addition, runoff water from the ramp itself flows through a grate directly into the well.

Exploration of the well revealed that it was excavated rather than drilled and that it was approximately 3 feet by 3 feet by 8 feet deep. The concrete-walled well directs storm water into a partially soil-filled, vertical crevice extending southwest-northeast in the limestone bedrock.

An Isco automatic water sampler was placed at the Lost River Rise previous to the start of the trace. Figure 1 shows the dye flow-through at the Rise. The water samples were analyzed for dye on a Turner fluorometer at the Hydrology Research Laboratory at Western Kentucky University. Dye concentrations were somewhat lower than expected but indicate a good trace. Turbidity associated with heavy rains will often produce low fluorometric readings on the fluorometer, but heavy rains did not occur during the trace. Also, the dye flow-through curve has the characteristic shape of a slug injection of dye into the Lost River. It is therefore believed that the low dye concentration levels indicate that much of the dye was absorbed by the soil and/or dispersed in a perched water table. The rapid flow-through, however, indicated that some of the dye was flushed almost directly into the fast-flowing Lost River.

Figure 2 indicates the probable route taken by the dye to the Lost River Rise. Notice that the Lost River is located only 300 feet east of the DESA loading ramp drainage well. A tributary stream flowing through a passage referred to by cavers as the "Ultimate Scunge" enters the Lost River almost at the closest point to the DESA loading ramp. Water samples were not collected from the Ultimate Scunge tributary during the trace due to the difficulty of access. However, water samples collected from the Scunge tributary in July were positive for Rhodamine WT dye. Since water samples taken from the perched water table directly above the Scunge passage were also positive, it appears that some dye from the loading ramp trace was still in the perched water table and was being slowly released into the Ultimate Scunge tributary.

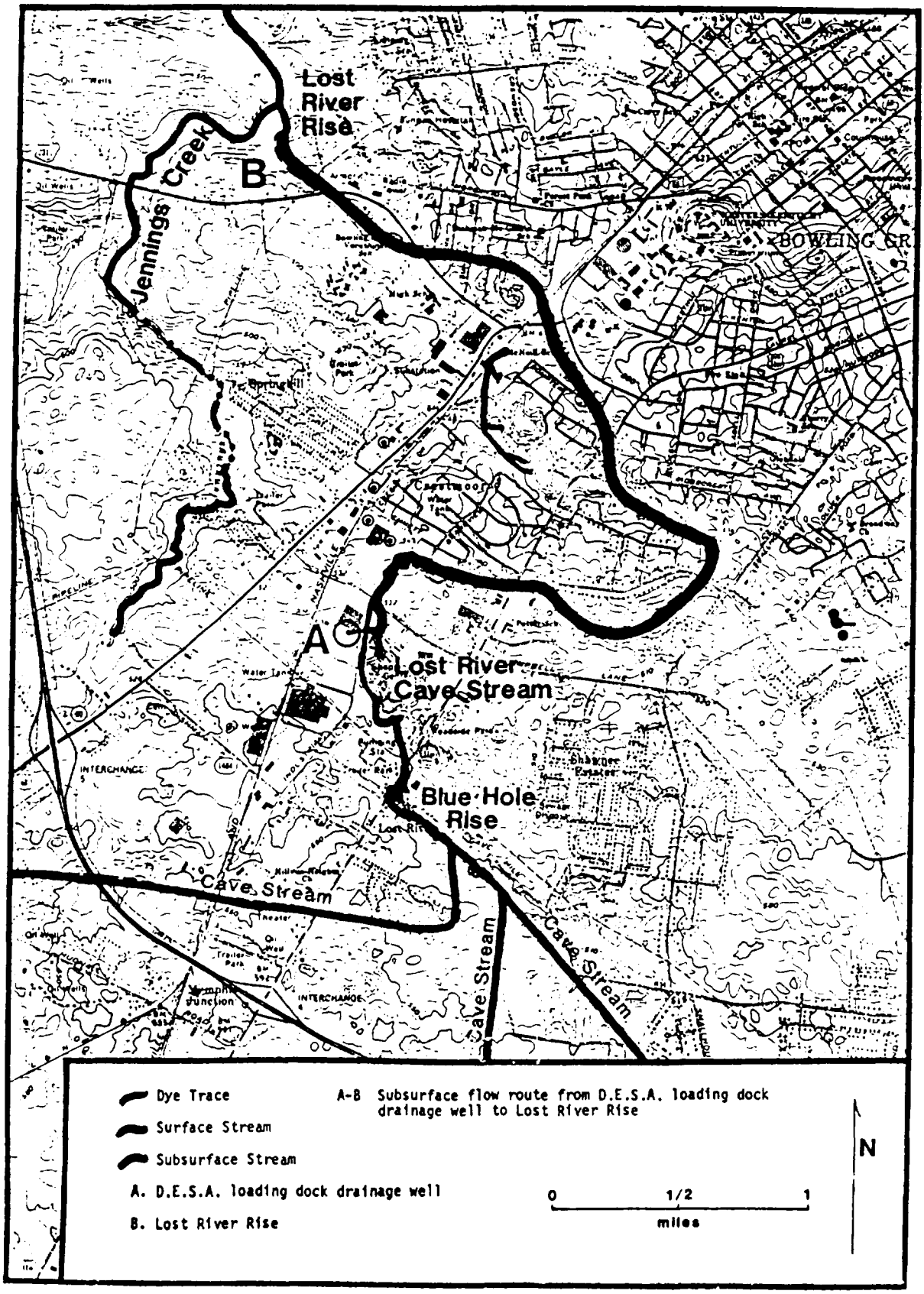

Lost River Rise
Jennings Creek
B
A
Lost River Cave Stream
Blue Hole Rise
Cave Stream
Cave Stream
Cave Stream
BOWLING GR
INTERCHANGE
INTERCHANGE
Dye Trace
Surface Stream
Subsurface Stream
A. D.E.S.A. loading dock drainage well
B. Lost River Rise
A-B Subsurface flow route from D.E.S.A. loading dock drainage well to Lost River Rise
0
1/2
1
miles
N

Figure 2.

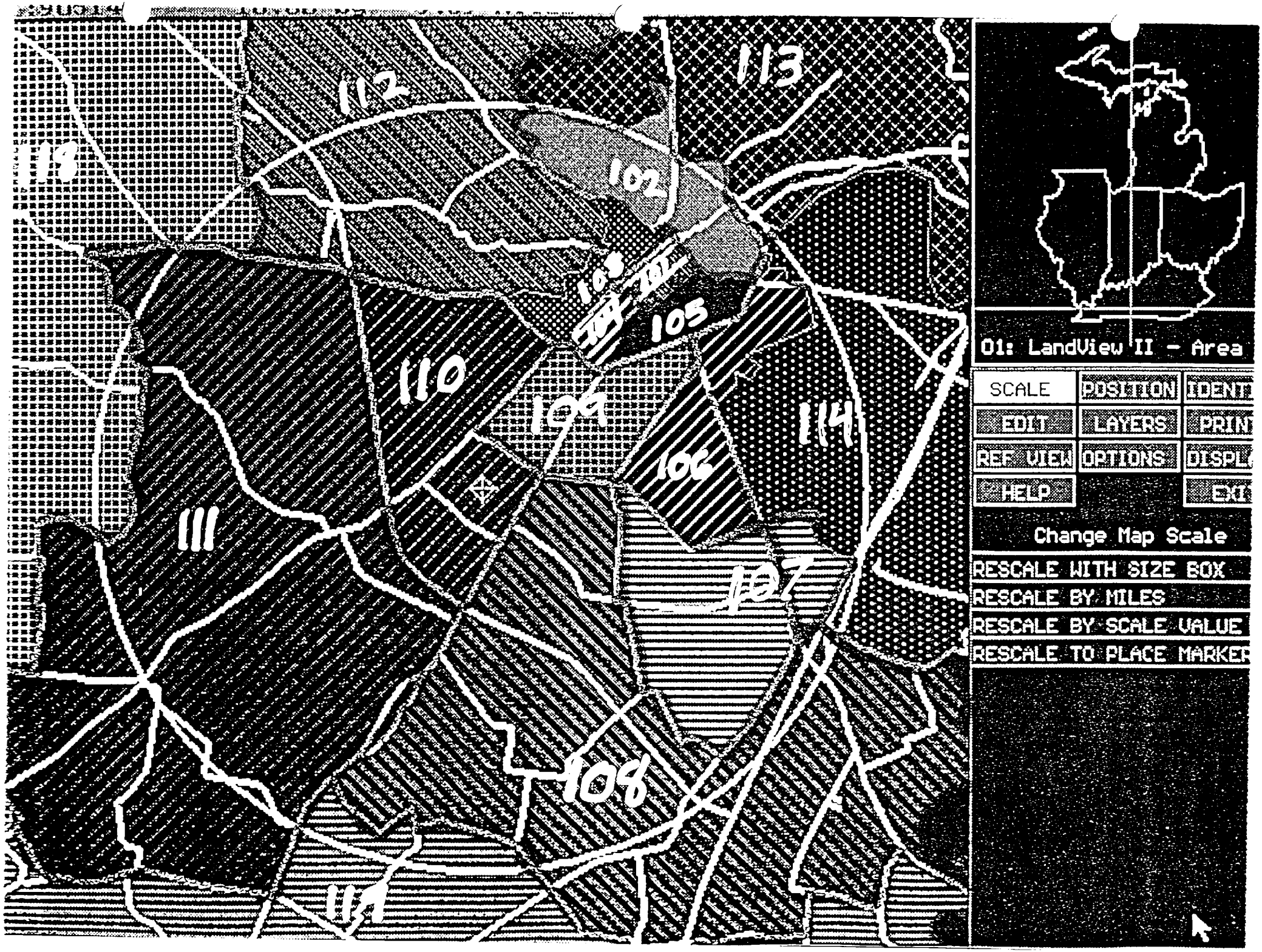
Estimate of Individuals Not on Municipal Water

Census tracts which were completely, or substantially, within a four-mile radius of the site were identified.

The water supply for housing units within each of these tracts were identified.

The units were summed for each category of water usage. Those units not on public or private systems were added. The sum was then multiplied by the average number of individuals per household.

Census Tract	Public System or Private Company	Individual Well (Drilled)	Individual Well (Dug)	Some Other Source
101	1302	0	0	0
102	1638	0	0	0
103	1540	0	0	0
104	193	0	0	0
105	1304	0	0	0
106	1911	0	0	0
107	2385	0	0	0
108	1963	4	9	0
109	1694	0	0	0
110	2250	0	0	0
111	1285	18	0	6
112	1502	0	0	5
114	1905	0	0	0
Total	20872	22	9	11
Housing Units Not on Public System or Private Company				42
Persons per Household				2.52
Persons Not on Public System or Private Company				106


113
112
102
105
110
104
106
114
111
107
108
01: LandView II - Area
SCALE
POSITION
IDENT
EDIT
LAYERS
PRIN
REF VIEW
OPTIONS
DISPL
HELP
EXI
Change Map Scale
RESCALE WITH SIZE BOX
RESCALE BY MILES
RESCALE BY SCALE VALUE
RESCALE TO PLACE MARKER

(no URL reload available)

1990 US Census Data
Database: **C90STF3A**
Summary Level: State--County--Census Tract

Tract 101: FIPS.STATE=21, FIPS.COUNTY90=227, FIPS.TRACT90=0101

SOURCE OF WATER
Universe: Housing units
Public system or private company.....1302
Individual well:
  Drilled.....0
  Dug.....0
Some other source.....0

Tract 102: FIPS.STATE=21, FIPS.COUNTY90=227, FIPS.TRACT90=0102

SOURCE OF WATER
Universe: Housing units
Public system or private company.....1638
Individual well:
  Drilled.....0
  Dug.....0
Some other source.....0

Tract 103: FIPS.STATE=21, FIPS.COUNTY90=227, FIPS.TRACT90=0103

SOURCE OF WATER
Universe: Housing units
Public system or private company.....1540
Individual well:
  Drilled.....0
  Dug.....0
Some other source.....0

Tract 104: FIPS.STATE=21, FIPS.COUNTY90=227, FIPS.TRACT90=0104

SOURCE OF WATER
Universe: Housing units
Public system or private company.....193
Individual well:
  Drilled.....0
  Dug.....0
Some other source.....0

Tract 105: FIPS.STATE=21, FIPS.COUNTY90=227, FIPS.TRACT90=0105

SOURCE OF WATER
Universe: Housing units
Public system or private company.....1304
Individual well:
  Drilled.....0
  Dug.....0

Some other source.....0

Tract 106: FIPS.STATE=21, FIPS.COUNTY90=227, FIPS.TRACT90=0106

SOURCE OF WATER
Universe: Housing units
Public system or private company.....1911
Individual well:
  Drilled.....0
  Dug.....0
Some other source.....0

Tract 107: FIPS.STATE=21, FIPS.COUNTY90=227, FIPS.TRACT90=0107

SOURCE OF WATER
Universe: Housing units
Public system or private company.....2385
Individual well:
  Drilled.....0
  Dug.....0
Some other source.....0

Tract 108: FIPS.STATE=21, FIPS.COUNTY90=227, FIPS.TRACT90=0108

SOURCE OF WATER
Universe: Housing units
Public system or private company.....1963
Individual well:
  Drilled.....4
  Dug.....9
Some other source.....0

Tract 109: FIPS.STATE=21, FIPS.COUNTY90=227, FIPS.TRACT90=0109

SOURCE OF WATER
Universe: Housing units
Public system or private company.....1694
Individual well:
  Drilled.....0
  Dug.....0
Some other source.....0

Tract 110: FIPS.STATE=21, FIPS.COUNTY90=227, FIPS.TRACT90=0110

SOURCE OF WATER
Universe: Housing units
Public system or private company.....2250
Individual well:
  Drilled.....0
  Dug.....0
Some other source.....0

Tract 111: FIPS.STATE=21, FIPS.COUNTY90=227, FIPS.TRACT90=0111

SOURCE OF WATER
Universe: Housing units
Public system or private company.....1285
Individual well:
  Drilled.....18
  Dug.....0
Some other source.....6

Tract 112: FIPS.STATE=21, FIPS.COUNTY90=227, FIPS.TRACT90=0112

SOURCE OF WATER
Universe: Housing units
Public system or private company.....1502
Individual well:
  Drilled.....0
  Dug.....0
Some other source.....5

Tract 113: FIPS.STATE=21, FIPS.COUNTY90=227, FIPS.TRACT90=0113

SOURCE OF WATER
Universe: Housing units
Public system or private company.....1246
Individual well:
  Drilled.....24
  Dug.....0
Some other source.....7

Tract 114: FIPS.STATE=21, FIPS.COUNTY90=227, FIPS.TRACT90=0114

SOURCE OF WATER
Universe: Housing units
Public system or private company.....1905
Individual well:
  Drilled.....0
  Dug.....0
Some other source.....0

Tract 115: FIPS.STATE=21, FIPS.COUNTY90=227, FIPS.TRACT90=0115

SOURCE OF WATER
Universe: Housing units
Public system or private company.....1508
Individual well:
  Drilled.....28
  Dug.....6
Some other source.....63

Tract 116: FIPS.STATE=21, FIPS.COUNTY90=227, FIPS.TRACT90=0116

SOURCE OF WATER
Universe: Housing units
Public system or private company.....1756
Individual well:

Drilled.....61
Dug.....15
Some other source.....33

Tract 117: FIPS.STATE=21, FIPS.COUNTY90=227, FIPS.TRACT90=0117

SOURCE OF WATER
Universe: Housing units
Public system or private company.....2041
Individual well:
Drilled.....66
Dug.....7
Some other source.....27

Tract 118: FIPS.STATE=21, FIPS.COUNTY90=227, FIPS.TRACT90=0118

SOURCE OF WATER
Universe: Housing units
Public system or private company.....1779
Individual well:
Drilled.....47
Dug.....35
Some other source.....70

Tract 119: FIPS.STATE=21, FIPS.COUNTY90=227, FIPS.TRACT90=0119

SOURCE OF WATER
Universe: Housing units
Public system or private company.....1222
Individual well:
Drilled.....90
Dug.....15
Some other source.....5

1990 CPH-L-4. Selected Population and Housing Characteristics
Warren County, Kentucky

Total population	76,673	Total housing units	31,065
SEX		OCCUPANCY AND TENURE	
Male	36,726	Occupied housing units	28,819
Female	39,947	Owner occupied	18,727
		Percent owner occupied	65.0
AGE		Renter occupied	10,092
Under 5 years	4,899	Vacant housing units	2,246
5 to 17 years	13,742	For seasonal, recreational, or occasional use	70
18 to 20 years	5,986	Homeowner vacancy rate (percent)	1.5
21 to 24 years	5,978	Rental vacancy rate (percent)	10.6
25 to 44 years	23,622		
45 to 54 years	7,977	Persons per owner-occupied unit	2.64
55 to 59 years	3,086	Persons per renter-occupied unit	2.29
60 to 64 years	2,859	Units with over 1 person per room	666
65 to 74 years	4,840		
75 to 84 years	2,785	UNITS IN STRUCTURE	
85 years and over	899	1-unit, detached	19,832
Median age	31.2	1-unit, attached	407
		2 to 4 units	3,705
Under 18 years	18,641	5 to 9 units	1,990
Percent of total population	24.3	10 or more units	1,144
65 years and over	8,524	Mobile home, trailer, other	3,987
Percent of total population	11.1		
HOUSEHOLDS BY TYPE		VALUE	
Total households	28,819	Specified owner-occupied units	13,044
Family households (families)	20,014	Less than $50,000	5,037
Married-couple families	16,080	$50,000 to $99,999	6,419
Percent of total households	55.8	$100,000 to $149,999	1,087
Other family, male householder	834	$150,000 to $199,999	276
Other family, female householder	3,100	$200,000 to $299,999	160
Nonfamily households	8,805	$300,000 or more	65
Percent of total households	30.6	Median (dollars)	57,600
Householder living alone	7,103		
Householder 65 years and over	2,629	CONTRACT RENT	
		Specified renter-occupied units paying cash rent	9,014
Persons living in households	72,547	Less than $250	3,947
Persons per household	2.52	$250 to $499	4,835
		$500 to $749	190
GROUP QUARTERS		$750 to $999	36
Persons living in group quarters	4,126	$1,000 or more	6
Institutionalized persons	888	Median (dollars)	265
Other persons in group quarters	3,238		
RACE AND HISPANIC ORIGIN		RACE AND HISPANIC ORIGIN OF HOUSEHOLDER	
White	69,566	Occupied housing units	28,819
Black	6,250	White	26,330
Percent of total population	8.2	Black	2,235
American Indian, Eskimo, or Aleut	115	Percent of occupied units	7.8
Percent of total population	0.1	American Indian, Eskimo, or Aleut	43
Asian or Pacific Islander	644	Percent of occupied units	0.1
Percent of total population	0.8	Asian or Pacific Islander	193
Other race	98	Percent of occupied units	0.7
Hispanic origin (of any race)	429	Other race	18
Percent of total population	0.6	Hispanic origin (of any race)	140
		Percent of occupied units	0.5

The user should note that there are limitations to many of these data. Please refer to the technical documentation provided with Summary Tape File 1A for a further explanation on the limitations of the data.

1990 CPH-L-81. Selected Social Characteristics: 1990 (Corrected)
Table 1. Warren County, Kentucky

The user should note that these data are based on a sample, subject to sampling variability, and that there are limitations to many of these data. Please refer to the technical documentation for Summary Tape File 3 for a further explanation of sampling variability and limitations of the data.

URBAN AND RURAL RESIDENCE		VETERAN STATUS	
Total population	76,673	Civilian veterans 16 years and over	8,062
Urban population	40,641	65 years and over	1,837
Percent of total population	53.0		
Rural population	36,032		
Percent of total population	47.0	NATIVITY AND PLACE OF BIRTH	
Farm population	3,736	Native population	75,753
		Percent born in State of residence	73.0
SCHOOL ENROLLMENT		Foreign-born population	920
Persons 3 years and over enrolled in school	22,735	Entered the U.S. 1980 to 1990	482
Preprimary school	927		
Elementary or high school	12,913	LANGUAGE SPOKEN AT HOME	
Percent in private school	2.9	Persons 5 years and over	71,807
College	8,895	Speak a language other than English	2,185
		Do not speak English "very well"	710
EDUCATIONAL ATTAINMENT		Speak Spanish	622
Persons 25 years and over	46,161	Do not speak English "very well"	129
Less than 9th grade	6,936	Speak Asian or Pacific Island language	498
9th to 12th grade, no diploma	6,479	Do not speak English "very well"	321
High school graduate	13,750		
Some college, no degree	8,216		
Associate degree	1,897		
Bachelor's degree	5,173		
Graduate or professional degree	3,710		
Percent high school graduate or higher	70.9	ANCESTRY	
Percent bachelor's degree or higher	19.2	Total ancestries reported	77,204
		Arab	94
RESIDENCE IN 1985		Austrian	35
Persons 5 years and over	71,807	Belgian	49
Lived in same house	35,341	Canadian	68
Lived in different house in U.S.	35,960	Czech	120
Same State	29,592	Danish	71
Same county	21,379	Dutch	1,610
Different county	8,213	English	12,922
Different State	6,368	Finnish	66
Lived abroad	506	French (except Basque)	2,015
		French Canadian	201
DISABILITY OF CIVILIAN NONINSTITUTIONALIZED PERSONS		German	13,619
		Greek	85
		Hungarian	108
Persons 16 to 64 years	51,081	Irish	12,809
With a mobility or self-care limitation	2,105	Italian	1,057
With a mobility limitation	1,231	Lithuanian	25
With a self-care limitation	1,401	Norwegian	229
With a work disability	4,745	Polish	518
In labor force	1,734	Portuguese	15
Prevented from working	2,586	Romanian	6
		Russian	140
Persons 65 years and over	8,018	Scotch-Irish	2,613
With a mobility or self-care limitation	1,983	Scottish	1,853
With a mobility limitation	1,576	Slovak	145
With a self-care limitation	1,227	Subsaharan African	67
		Swedish	617
CHILDREN EVER BORN PER 1,000 WOMEN		Swiss	136
		Ukrainian	8
		United States or American	13,453
Women 15 to 24 years	218	Welsh	549
Women 25 to 34 years	1,290	West Indian (excluding Hispanic origin groups)	63
Women 35 to 44 years	1,975	Yugoslavian	78
		Other ancestries	11,760

1990 CPH-L-81. Selected Labor Force and Commuting Characteristics: 1990
Table 2. Warren County, Kentucky

The user should note that these data are based on a sample, subject to sampling variability, and that there are limitations to many of these data. Please refer to the

technical documentation for Summary Tape File 3 for a further explanation of sampling variability and limitations of the data.

LABOR FORCE STATUS		OCCUPATION	
Persons 16 years and over	60,028	Employed persons 16 years and over	37,117
In labor force	39,802	Executive, administrative, and managerial occupations	3,938
Percent in labor force	66.3	Professional specialty occupations	4,776
Civilian labor force	39,733	Technicians and related support occupations	1,146
Employed	37,117	Sales occupations	5,140
Unemployed	2,616	Administrative support occupations, including clerical	5,144
Percent unemployed	6.6	Private household occupations	194
Armed Forces	69	Protective service occupations	487
Not in labor force	20,226	Service occupations, except protective and household	4,275
Males 16 years and over	28,153	Farming, forestry, and fishing occupations	1,115
In labor force	21,157	Precision production, craft, and repair occupations	3,993
Percent in labor force	75.2	Machine operators, assemblers, and inspectors	3,600
Civilian labor force	21,090	Transportation and material moving occupations	1,557
Employed	19,784	Handlers, equipment cleaners, helpers, and laborers	1,752
Unemployed	1,306		
Percent unemployed	6.2	INDUSTRY	
Armed Forces	67	Employed persons 16 years and over	37,117
Not in labor force	6,996	Agriculture, forestry, and fisheries	1,158
Females 16 years and over	31,875	Mining	147
In labor force	18,645	Construction	1,989
Percent in labor force	58.5	Manufacturing, nondurable goods	3,243
Civilian labor force	18,643	Manufacturing, durable goods	4,604
Employed	17,333	Transportation	939
Unemployed	1,310	Communications and other public utilities	674
Percent unemployed	7.0	Wholesale trade	1,340
Armed Forces	2	Retail trade	8,232
Not in labor force	13,230	Finance, insurance, and real estate	1,505
Females 16 years and over	31,875	Business and repair services	1,125
With own children under 6 years	4,234	Personal services	1,306
Percent in labor force	61.0	Entertainment and recreation services	478
With own children 6 to 17 years only	5,706	Health services	2,914
Percent in labor force	76.8	Educational services	4,398
Own children under 6 years in families and subfamilies	5,600	Other professional and related services	1,810
All parents present in household in labor force	3,061	Public administration	1,255
Own children 6 to 17 years in families and subfamilies	12,212	CLASS OF WORKER	
All parents present in household in labor force	8,521	Employed persons 16 years and over	37,117
Persons 16 to 19 years	5,863	Private wage and salary workers	28,664
Not enrolled in school and not high school graduate	397	Government workers	5,780
Employed or in Armed Forces	184	Local government workers	1,982
Unemployed	98	State government workers	3,232
Not in labor force	115	Federal government workers	566
COMMUTING TO WORK		Self-employed workers	2,456
Workers 16 years and over	36,479	Unpaid family workers	217
Percent drove alone	78.1		
Percent in carpools	13.7		
Percent using public transportation	0.5		
Percent using other means	1.0		
Percent walked or worked at home	6.7		
Mean travel time to work (minutes)	17.0		

1990 CPH-L-81. Income and Poverty Status in 1989: 1990
Table 3. Warren County, Kentucky

The user should note that these data are based on a sample, subject to sampling variability, and that there are limitations to many of these data. Please refer to the technical documentation for Summary Tape File 3 for a further explanation of sampling variability and limitations of the data.

INCOME IN 1989		POVERTY STATUS IN 1989	
Households	28,788	All persons for whom poverty	
Less than $5,000	2,636	status is determined	72,533
$5,000 to $9,999	3,665	Below poverty level	12,688
$10,000 to $14,999	3,285		
$15,000 to $24,999	5,210	Persons 18 years and over	54,263
$25,000 to $34,999	4,810	Below poverty level	8,578
$35,000 to $49,999	4,803	Persons 65 years and over	8,018
$50,000 to $74,999	3,098	Below poverty level	1,557
$75,000 to $99,999	691		
$100,000 to $149,999	308	Related children under 18 years	18,205
$150,000 or more	282	Below poverty level	4,048
Median household income (dollars)	24,175	Related children under 5 years	4,777
		Below poverty level	1,392
Families	20,189	Related children 5 to 17 years	13,428
Less than $5,000	1,117	Below poverty level	2,656
$5,000 to $9,999	1,645		
$10,000 to $14,999	1,898	Unrelated individuals	11,196
$15,000 to $24,999	3,457	Below poverty level	3,898
$25,000 to $34,999	3,862		
$35,000 to $49,999	4,239	All families	20,189
$50,000 to $74,999	2,835	Below poverty level	2,689
$75,000 to $99,999	621	With related children under	
$100,000 to $149,999	283	18 years	10,601
$150,000 or more	232	Below poverty level	1,858
Median family income (dollars)	30,016	With related children under	
		5 years	3,984
Nonfamily households	8,599	Below poverty level	957
Less than $5,000	1,533		
$5,000 to $9,999	2,108	Female householder families	2,890
$10,000 to $14,999	1,368	Below poverty level	1,148
$15,000 to $24,999	1,707	With related children under	
$25,000 to $34,999	935	18 years	1,936
$35,000 to $49,999	567	Below poverty level	935
$50,000 to $74,999	246	With related children under	
$75,000 to $99,999	60	5 years	628
$100,000 to $149,999	25	Below poverty level	457
$150,000 or more	50		
Median nonfamily household		Percent below poverty level:	
income (dollars)	12,127	----------	
Per capita income (dollars)	11,819	All persons	17.5
		Persons 18 years and over	15.8
INCOME TYPE IN 1989		Persons 65 years and over	19.4
Households	28,788	Related children under 18 years	22.2
With wage and salary income	22,656	Related children under 5 years	29.1
Mean wage and salary		Related children 5 to 17 years	19.8
income (dollars)	29,146	Unrelated individuals	34.8
With nonfarm self-employment income	3,303		
Mean nonfarm self-employment		All families	13.3
income (dollars)	19,497	With related children under	
With farm self-employment income	1,510	18 years	17.5
Mean farm self-employment		With related children under	
income (dollars)	3,684	5 years	24.0
With Social Security income	7,255		
Mean Social Security		Female householder families	39.7
income (dollars)	6,937	With related children under	
With public assistance income	2,262	18 years	48.3
Mean public assistance		With related children under	
income (dollars)	3,187	5 years	72.8
With retirement income	3,856		
Mean retirement income (dollars)	7,685		

1990 CPH-L-81. Selected Housing Characteristics: 1990
Table 4. Warren County, Kentucky

The user should note that these data are based on a sample, subject to sampling variability, and that there are limitations to many of these data. Please refer to the technical documentation for Summary Tape File 3 for a further explanation of sampling variability and limitations of the data.

Total housing units	31,065	VEHICLES AVAILABLE

YEAR STRUCTURE BUILT	
1989 to March 1990	724
1985 to 1988	3,300
1980 to 1984	3,926
1970 to 1979	8,025
1960 to 1969	5,658
1950 to 1959	3,740
1940 to 1949	1,961
1939 or earlier	3,731
BEDROOMS	
No bedroom	298
1 bedroom	3,415
2 bedrooms	9,533
3 bedrooms	13,637
4 bedrooms	3,464
5 or more bedrooms	718
SELECTED CHARACTERISTICS	
Lacking complete plumbing facilities	217
Lacking complete kitchen facilities	334
Condominium housing units	91
SOURCE OF WATER	
Public system or private company	30,424
Individual drilled well	338
Individual dug well	87
Some other source	216
SEWAGE DISPOSAL	
Public sewer	17,592
Septic tank or cesspool	13,235
Other means	238
Occupied housing units	28,819
HOUSE HEATING FUEL	
Utility gas	14,439
Bottled, tank, or LP gas	2,014
Electricity	9,679
Fuel oil, kerosene, etc.	566
Coal or coke	58
Wood	1,933
Solar energy	12
Other fuel	108
No fuel used	10
YEAR HOUSEHOLDER MOVED INTO UNIT	
1989 to March 1990	6,960
1985 to 1988	8,310
1980 to 1984	4,043
1970 to 1979	5,115
1960 to 1969	2,518
1959 or earlier	1,873
TELEPHONE	
No telephone in unit	2,618

Occupied housing units	28,819
None	2,794
1	9,074
2	11,379
3 or more	5,572
MORTGAGE STATUS AND SELECTED MONTHLY OWNER COSTS	
Specified owner-occupied housing units	13,074
With a mortgage	8,306
Less than $300	639
$300 to $499	2,516
$500 to $699	2,630
$700 to $999	1,810
$1,000 to $1,499	561
$1,500 to $1,999	86
$2,000 or more	64
Median (dollars)	567
Not mortgaged	4,768
Less than $100	575
$100 to $199	3,165
$200 to $299	846
$300 to $399	92
$400 or more	90
Median (dollars)	153
SELECTED MONTHLY OWNER COSTS AS A PERCENTAGE OF HOUSEHOLD INCOME IN 1989	
Specified owner-occupied housing units	13,074
Less than 20 percent	8,311
20 to 24 percent	1,838
25 to 29 percent	972
30 to 34 percent	563
35 percent or more	1,295
Not computed	95
GROSS RENT	
Specified renter-occupied housing units	9,692
Less than $200	1,292
$200 to $299	2,284
$300 to $499	4,677
$500 to $749	742
$750 to $999	126
$1,000 or more	51
No cash rent	520
Median (dollars)	337
GROSS RENT AS A PERCENTAGE OF HOUSEHOLD INCOME IN 1989	
Specified renter-occupied housing units	9,692
Less than 20 percent	2,934
20 to 24 percent	1,190
25 to 29 percent	990
30 to 34 percent	806
35 percent or more	3,140
Not computed	632

(URL reload)

1990 US Census Data
Database: **C90STF3A**
Summary Level: State--County

Warren County: FIPS.STATE=21, FIPS.COUNTY90=227

SOURCE OF WATER
Universe: Housing units

Public system or private company	30424
Individual well:	
Drilled	338
Dug	87
Some other source	216

Record of Communication

☑ PHONE CALL ☐ DISCUSSION ☐ ON-SITE
☐ CONFERENCE ☐ OTHER ☐ ON-CALL

TO: Rick Hogan

FROM: Alan McKee 502 782-4383

DATE: 4/30/98

TIME: 2:30 PM

SUBJECT: Municipal water users within 4 mile radius of Eaton Corp.

SUMMARY OF COMMUNICATION:

Alan works for Bowling Green Municipal Utilities. He stated that there are only 2 residences not on their municipal line, ~~in their service area~~ which ~~supplies~~ serves all of the area within a 4 mile radius of Eaton. Both are across the RR tracks from Eaton. They are:

1: J & M Gun Shop - on a different municipal system.

2: A residence whose address is unknown, but is located between addresses 2052 & 2110 Russellville Road (Hwy 6886). It is suspected that they have a well.

Rick Hogan

CONCLUSIONS, ACTION TAKEN OR REQUIRED:

INFORMATION COPIES TO:

Site Name: EATON CORP BOWLING GREEN PLT

								Planned				Actual						
S		C		OU	Action Name	Sq	Ld	Start	FYQ	Complete	FYQ	Start	Complete	Σ	R	Qual	Takeover Phased	SCAP Note	EPA Person
				00	DISCOVERY	1	F	00/00/0000		00/00/0000		00/00/0000	08/01/1980						
				00	PRELIMINARY ASSESSMENT	1	S	00/00/0000		00/00/0000		00/00/0000	08/01/1984			L			
				00	SITE INSPECTION	1	F	00/00/0000		00/00/0000		00/00/0000	08/30/1989			N			
				00	SITE INSPECTION	2	F	00/00/0000		00/00/0000		00/00/0000	02/28/1990			D			

****

Sensitive information. Official use only. Shred/burn to dispose.

****

Eaton Corporation RCRIS Info CA Detail Report

* * * CORRECTIVE ACTION REPORT * * *

Handler Name / ID / Address	S	O	N	P	V	Regulated Activities
EATON CORPORATION				P		
KYD098950306 2901 INDUSTRIAL DRIV, BOWLING GREEN						

- - - - - - - - - - - - - - CORRECTIVE ACTION EVENTS - - - - - - - - - - - - - -

Event/Status/Instrument/Area/Comments	Staff	Schedule	Actual
CA225(01) STABILIZATION MEASURES EVALUATION	E	LEF	05/14/92
CA075(01) CA PRIORITIZATION	E		03/31/92
CA050(01) RFA COMPLETED	J	LF	10/30/90
CA070(01) DETERMINATION OF NEED FOR A RFI	E		10/30/90

* * * * * E N D O F R E P O R T * * * * *

****

Sensitive information. Official use only. Shred/burn to dispose.

****

RCRIS Info Permitting/Closure Detail Report

* * * PERMIT, CLOSURE, POST/CLOSURE REPORT * * *

Handler Name / ID / Address	S	O	N	P	V	Regulated Activities
EATON CORPORATION				P		
KYD098950306 2901 INDUSTRIAL DRIV, BOWLING GREEN						

TREATMENT/STORAGE/DISPOSAL (TSD) UNITS

Unit Name	Sequence #	Design Capacity	As-of	C Leg	Op
UNITS INTERIM STATUS and CLEAN CLOSED					
SUR IMP	S04 001-002	857,000.000 GALLON	12/11/84	IS	CC
	S04 001	857,000.000 GALLON	06/14/84	IS	IN

EVENTS (001 CLOSUR001) STATE: SQU EPA:

Event / Status / Covered Units / Comments	Staff	Scheduled	Actual
CL-002(01) PART A DETERMINATION	S		12/11/84
CL-380(01) CLOSURE VERIFICATION	S		12/11/84
CL-370(01) RECEIVE CLOSURE CERTIFICATION	S		10/22/84
CL-360(01) PLAN APPROVED - CLOSURE	S		08/06/84
CL-340(01) PUBLIC NOTICE - CLOSURE	S		06/28/84
CL-405(01) COST ESTIMATED/FUNDING ADEQUATE	S		06/20/84
CL-310(01) PLAN RECEIVED - CLOSURE	S		06/14/84
CL-001(01) PART A RECEIVED	S		10/22/82

* * * * * E N D O F R E P O R T * * * * *

****

Enforcement sensitive information. Official use only. Shred/burn to dispose.

****

RCRIS Info Compliance/Enforcement Detail Report

* * * COMPLIANCE MONITORING AND ENFORCEMENT REPORT * * *

Handler Name / ID / Address	S	O	N	P	V	Regulated Activities
EATON CORPORATION				P		
KYD098950306 2901 INDUSTRIAL DRIV, BOWLING GREEN						

- - - EVALUATIONS - - - - - - - - - - - - - - - - - - Areas Evaluated

Type	Date	Seq	Staff	Description	(Violations Found)
CEI	11/19/96		S BGMCR	COMPLIANCE EVALUATION INS	
CSE	04/13/94		S HWWSC	09/COMPLIANCE SCHEDULE EVALU	GOR(0005S)
NRR	03/28/94		S HWWSC	09/NON-FINANCIAL RECORD REVI	GOR(0005S)
CSE	10/18/93		S BGRMC	COMPLIANCE SCHEDULE EVALU	GMR(0004S) GRR(0003S)
CEI	09/24/93		S BGRMC	COMPLIANCE EVALUATION INS	GGR GLB
NRR	07/30/91		S HWWSC	NON-FINANCIAL RECORD REVI	GOR(0001S)
CEI	03/22/91		S BGJWA	COMPLIANCE EVALUATION INS	GER GGR
NRR	03/19/91		S HWVFR	07/NON-FINANCIAL RECORD REVI	GRR
NRR	08/23/90	002	S VFR	NON-FINANCIAL RECORD REVI	DOT
CEI	07/19/90	001	S JWA	COMPLIANCE EVALUATION INS	DLB DOT
NRR	03/22/90		S ENJFA	NON-FINANCIAL RECORD REVI	GPT(0002S)
NRR	05/18/89		S HWSVE	NON-FINANCIAL RECORD REVI	GRR
CEI	05/05/89		S JWD	COMPLIANCE EVALUATION INS	GGR
CEI	02/15/84	001	X	COMPLIANCE EVALUATION INS	CAS DCL

- - - VIOLATIONS - - - - - - - - - - Compliance - Latest Enforcement

Area	Date	Seq	Staff	Class	Scheduled	Actual	Type	Date	Num
GOR	03/28/94	0005	S HWWSC	2	05/02/94	04/04/94	120	03/29/94	S
GMR	09/24/93	0004	S BGRMC	1-7	10/18/93	10/18/93	190	09/28/93	S
GRR	09/24/93	0003	S BGRMC	2	10/18/93	10/18/93	190	09/28/93	S
GOR	07/30/91	0001	S HWWSC	2	10/21/91	10/02/91	120	09/27/91	S
GPT	03/22/90	0002	S ENJFA	1	02/03/92	02/03/92	380	02/03/92	S

- - ENFORCEMENT - Violations Addressed

Type	Date	Seq	Staff	Attorney	Enforcement Number	Type(Sequence #)
120	03/29/94		S HWWSC			GOR(0005S)
190	09/28/93		S BGRMC			GRR(0003S) GMR(0004S)
380	02/03/92		S ENJFA			GPT(0002S)
120	09/27/91		S HWWSC			GOR(0001S)

* * * * * E N D O F R E P O R T * * * * *

Eaton

- Site not scored
- No sampling performed - need with hole + last river samples. 1984
- Closure verification samples, were analyzed for EP-Tox & Cyanides only
- Div. of Water data should have been included in appendix and used as evidence of "Observed Release"
- "Qualified Removal Guidance" not followed completely - Waste Quantity not zero, since release observed.
- 3 times bckgrd is number used for ID of observed release - is not a cleanup level. Also, not appropriate to use EP tox. numbers.